POPULAR Computing WEEKLY

SPECIAL TAPE OFFER

35p 2-8 February 1984 Vol 3 No 5

## This Week



STAR
Follow on BBC B
See page 10
GAME

## News Desk

### Laser's future in doubt

THE future of the Laser 200 computer now looks uncertain following the collapse of its UK distributor, Computers For All.

The company formally notified its dealers last Thursday that due to financial difficulties it had ceased trading.

The crash could prove fatal for the £69.95 Laser 200. The machine has not been adopted by any of the major high street chains, and software for the machine is in very short supply.

The Laser 200 has had a

Continued on page 5

### CBM micros in UK by the summer

COMMODORE is to sell its new range of microcomputers — the successors to the Commodore 64 — in the UK by the early summer.

The most sophisticated of the new machines will be priced well under £400 although the choice of models to be offered in Britain has still to be decided.

There is more to Commodore's new range than the two micros — the 264 and the V364 — previewed at the CES trade fair in Las Vegas last month.



These machines are just two options from a wh[illegible] range of computers. Using [illegible] design Commodore can produce a new micro with [illegible] of three types of keyboard and anything from 16K [illegible] Ram in 8K steps.

The three figure [illegible] numbers for the computers [illegible] the keyboard type [illegible] number and memory [illegible] in the other two. For example the Commodore [illegible] calculator type keyboard [illegible] 16K Ram. The 264 [illegible] professional keyboard and [illegible] Ram while the V364 [illegible] built in voice synthesi[illegible] professional keyboard with separate numeric pad and [illegible] Ram. All of the [illegible] built around the [illegible] sor chip [illegible] development of the 6502 with [illegible] video processor.

Commodore has chosen [illegible] design because [illegible] markets around the world [illegible] different [illegible] development and Commo[illegible]

Continued on page 5



Continued on page 50

BRITAIN'S BEST-SELLING MICRO WEEKLY




2-8 February 1984 Vol 3 No 5

SUNSHINE

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*Popular Computing Weekly*
12-13 Little Newport [illegible]
[illegible] WC2R 3LD
Telephone 01-437 4343
Published by Sun[illegible] Ltd
Typesetting [illegible] by Chesham Press [illegible]
Distributed by S M D[illegible]
London SW9 01 [illegible] 71 [illegible] Telex 261[illegible]


ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
Registered at the Post Office as a newspaper
ISSN 0265-0509



## This Week



## Editorial

THE announcement that Timex will neither manufacture Sinclair s QL computer nor market it in the US has led to speculation that the three year association between the two companies may be nearing an end

Yet the reason Timex will not manufacture the QL is a technical one Timex s plant in Dundee would not have been suitable without considerable further investment in the site — a step Timex are unwilling to make

As for the reason the QL will not be sold by Timex in the States, most observers point to Timex s poor handling of the previous American Sinclair machine, the 2068 version of the Spectrum By dithering for almost a year Timex has denied the 2068 wide distribution and by early December only around 40 000 had been sold

Timex proved to be too big an organisation to move quickly, and speed — as others like Atari and TI have found to their cost — is vital for a successful micro company

But it is not Timex s performance which has been the main deciding influence on Sinclair choosing to sell the US QL itself The reason for going it alone is simple Sinclair is a far stronger company now than it was two years ago and — never shy of a challenge — it now wants to see if it can crack The Big One

Unfortunately Timex s record with the 2068 will not have helped Sinclair s job of selling the QL in America

And Timex without the QL, seems unlikely to be able to continue as a force in the micro world except as an assembly facility

## Next Thursday

**You must guide your unarmed robot around the screen, avoiding the deadly red blocks — at the same time you are being followed by a red droid. Follow — next week's game for BBC model B by Andrew Pfehler**

# Off the board for Scrabble

BOARD game makers Waddingtons and J W Spear have teamed up with a new company — Leisure Genius — to produce microcomputer versions of their famous titles

This follows a first successful venture by Leisure Genius associate company Little Genius last year — the top selling program of J W Spear's *Scrabble* for the Spectrum. That project was programmed by Psion and marketed by Sinclair. Now Leisure Genius has established its own programming team to develop *Scrabble* for other computers. A Commodore 64 version will appear in March to be followed by a BBC Model B program

In what appears to be a major change of policy Waddingtons has also signed up with Leisure Genius. Waddingtons had previously seemed to view micros as a threat to its board game trade rather than as a new development in games

Leisure Genius will sell a version of *Cluedo* for the Commodore 64 in March to be followed by a Spectrum conversion in May

The company is also to sell a micro title based on the Invicta game *Mastermind*

All programs will sell for between £7.95 and £14.95

Says Peter Deutsch managing director of Leisure Genius "What we are doing is an extension of what Melbourne House has done with *The Hobbit*. We now have considerable experience of dealing with board game manufacturers and we see ourselves very much as an extension of those companies

"We also hope these relationships will continue. For Waddingtons we are currently developing computer programs based on their new range of pre-school educational toys

## Century collapses

CENTURY Electronics, the only UK company designing arcade game machines, has gone into liquidation

The company, based in Manchester, was the biggest originator of coin-operated video games outside Japan and the US.



It was best known for the development of one of last year's most successful arcade titles — *Hunchback*. The game was also successfully licenced to two home computer software houses: Superior Software for the BBC version and Ocean for the Spectrum, Oric and Commodore 64 conversions

Century was one of the first arcade game companies to licence its titles for home computers and its managing director David Jones campaigned vigorously against unauthorised home computer versions of coin operated games

## Laser 200

Continued from page 1

chequered career. It is one of a number of machines — including the Comex 35 — designed and built by a Hong Kong based company Video Technology. It made its first appearance in an earlier guise as the Texet. Then Video Technology linked up with Leisure Zone to promote both machines to be distributed by Computers For All

In the middle of last year Leisure Zone and Video Technology parted and Computers For All became sole distributor for the Laser 200 and Comex 35 computers

Computers For All — the trading name of Moranbrook — was formed by Jeff Weinrich in 1980 and began by producing software for the ZX80. The company switched to retail distribution of computers beginning with the Dragon One and more recently the Tandy Model III

First deliveries of the Laser through Computers For All began in September 1983

## Commodore

Continued from page 1

dore's many subsidiaries each have different requirements for a new machine

It has apparently still not been decided which machines from the range will appear here in the early summer. Commodore UK is known to be keen on the 116 machine as a competitor for the Sinclair Spectrum. It seems likely that the 264 will be sold in Britain

## Single-board 6809 system for BBC

SOMEWHAT in advance of Acorn's own expected Z80 and 6809 second processors for the BBC micro comes a single board 6809 system from Cambridge Microprocessor Systems

The board can either sit inside the machine connecting via the tube interface or be connected using a Eurorack if expansion of the 6809 bus interface is required

Once installed the system allows disc software written for the Flex operating system to be run on the BBC — including a number of high-level languages like PL9, C, BCPL, Forth and Fortran

The 6809 system includes a monitor Rom and a BBC Basic program on disc to link in the new processor card. The price for the board is £249 and the Flex operating system costs another £130. Details from Cambridge Micro Processor Systems, 11 St Margaret's Road, Girton, Cambridge

## Speech cartridge for the 64

COMMODORE is working on a Text/Speech cartridge for the Commodore 64

The software Rom will plug into the Magic Voice sound synthesiser unit and convert text simply keyed in to speech

## IBM college scheme

IBM has announced a £400,000 scheme to provide colleges with microcomputers

Ninety two selected universities and polytechnics will each receive a free IBM PC machine under the plan

## Macintosh micro from Apple



*APPLE has formally announced its new Macintosh computer*

*It offers the same window graphics and mouse cursor control as Apple's Lisa machine but at around a third of the price*

*The Macintosh uses the 68000 processor, from the same family of chips as that used in the new Sinclair QL*

*It has a built in 9 inch black and-white screen, single 3½ inch disc drive, 128K Ram, 64K Rom, built-in clock and external disc, RS-232 and RS-422 interfaces*

*The machine will sell in the US for between $3,000 and $3,500. It is expected to arrive over here in April priced around £2,500*

## Philips talk to Atari

WISSE Dekker, President of the Dutch electronics giant Philips, has confirmed that his company has been involved in talks with the troubled US microcomputer manufacturer Atari concerning a number of possible joint ventures

The preliminary discussions have dealt mainly with Atari's interests outside the US. Under consideration has been the possibility of a joint venture in Europe to expand Atari International and the idea of a research effort by the two companies to develop video-disc games using Philips Laservision technology

Both Dekker and Atari's chief executive James Morgan have denied rumours concerning a possible takeover of Atari International by Philips (see *Popular Computing Weekly* December 15)

Over the last nine months Atari has produced a deficit of over $500m




## A NEW DIMENSION IN EXCITEMENT FROM VORTEX SOFTWARE.

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## Ideal language

I write in response to Jeremy Ruston's outline of an ideal high level language (*PCW* 12 18 January) The @ indirection operator he describes is in fact simply the Spectrum's *Val* function! The Spectrum does *Val* x$ by looking at x$ and using it as an indirect pointer to the variable or other expression whose name is written there If the expression is a string you must of course use *Val$* provided by Sinclair for this purpose The method can be applied to any depth

My own ideal language would be a sort of hybrid of BBC and Spectrum Basic — it should have the huge array of structures provided on the BBC but also the unique flexibility of the Spectrum's interpreter which manages to understand things you intuitively feel Basic ought to understand like *Goto* variable *Gosub* variable and so on Do any other readers have views on what they would consider an ideal language?

*Iain D Stewart*
*17 Torry Drive*
*Alva*
*Central Region*
*Scotland FK12 5NQ*

## Pimania solved

**STOP PRESS**

I've solved Pimania ?!

Repeat I have solved Pimania

I know when where, why, for what for how much, to whom etc etc, etc

Cancel Pimania adverts very soon Yipeeeeee!

See you there, Mr Pi

*Yours*
*A Faithful Pimaniac*

## Very average

I'm getting sick and fed up with your correspondence on high scores on Arcade style games I'm very average indeed at these games and I'm proud of it

I mean what imaginative person wants to go through the repetitive motions of playing a game just to achieve 999 990 Surely the game ceases to be a challange at around the 100,000 mark Personally I prefer adventures it took me just over eight hours to complete the excellent Black Crystal — beat that arcade junkies!!

*Gareth P Jones*
*6 Victor Road*
*South Kirkby*
*Pontefract*
*W Yorks*
*WF9 3DF*

**If any arcade junkies can beat that perhaps they would just like to smile knowingly to themselves**

## Down under

In a recent issue of *PCW* Andy Wilson asked what a Bunyip was Well it's a creature of Australian Aboriginal folklore The story is (roughly) this the Bunyip lived with its mother at the bottom of a deep pool but was kidnapped by some Aborigines I think its mother was something to do with water or rain Anyway she got a bit upset and nasty and got her Bunyip back I can't remember why, but now Aborigines treat some waters with respect

*Brian Langley*
*34 Royal Sussex Crescent*
*Eastbourne*
*E Sussex*

## Commodore tip

Here is a tip for Commodore 64 owners Whilst it is true that you can not enter more than two lines of text from the keyboard a program typed in on a Vic20 and saved on disc or tape and then loaded into the 64 will be accepted and will also Run (provided, of course that *Peek* and *Poke* commands do not clash)

*Richard Barton*
*133 Stamford Road*
*Dagenham*
*Essex*

*We'd better settle the matter before we begin manufacturing*

## A mirror image on screen

I've seen a program in a past issue of your magazine that copies a third of the screen of the Spectrum to the middle The author of the program suggests that a routine like this could be used to produce a mirror image of the top third of the screen to the bottom third

On writing such a routine I decided that it was too slow to use usefully in a program However the following machine code routine provides an almost instant reflection of the top eight lines to the bottom eight This leaves eight lines in the middle as the routine uses the bottom two lines not normally available in Basic

The routine is totally relocatable, making it suitable for both 16K and 48K Spectrums To activate type Randomise USR start address

*David Channon*
*5 Bowland Drive*
*Walton Park*
*Chesterfield*

```
10 PRINT  WHERE DO YOU WISH TH
E ROUTINE  TO BE LOCATED.
20 INPUT a
30 FOR n=a TO (a+33)
40 READ d  POKE n d
50 NEXT n
60 DATA 33,0,64,17,224 87,0 64
,197,6 32 126,213,229,213,220,11
9,225,209,35,19,16,244,197,6,64,
25 16,253 193,193 16 231 201 0
```

## Sadistic preview

I read with great interest Andy Pennell's preview of the Sinclair QL As a Spectrum owner I was particularly interested in his comments concerning provision on the Spectrum fo a colour composite monitor How sadistic can you get!

You fed me the sprat and left the mackeral unhookable! Please put me out of my misery document the undocumented and tell me what needs to be done to hook up my Spectrum to a colour composite monitor

To change the subject I do agree with Steven Mason that you tend to concentrate too much on games and not enough on more serious software I think there are more of us using our micros for things other than games than you realise

*J R Ryder*
*Greenfields*
*Greenfields Close*
*Heath Green Lane*
*Horley*
*Surrey*

**Andy Pennell writes**
**The answer depends on which model of Spectrum you have. In models one and two there is a line marked *Video* on the PCB which you simply have to connect up to the edge connector with a blob of solder Most model threes already have this connection made Once done, simply hook up a lead from the edge connecter to the monitor**

## Ace enthusiasts

In reply to John Noyce's letter regarding the Ace Users Club what I and many Ace users want is an independent club where ideas and programs can be exchanged freely We do not want a club that is just a front for a software house trying to boost its sales

More power to Phil Murray — let's get the Ace Club for Enthusiasts on the road

*Derek Thomas*
*32 Bathurst*
*Orton Goldhay*
*Peterborough*
*Cambs*

# ULTIMATE

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# Bandit

**A new game for 16/48K Spectrum by K Deakes**

Bandit is a fruit machine for both the 16K and 48K Spectrum which has all the features of the real thing, except of course actually paying out. It is written in two parts in order to fit it into the 16K machine which would otherwise be difficult.

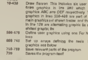
You begin with £1 and each go costs 10p. Apart from just spinning the reels there are also random hold and nudge features indicated by relevant noises and flashing lights. The holds allow you to hold any of the reels on the following go by pressing keys *1*, *2* or *3* as appropriate. Before a reel can be nudged key *N* must be pressed to determine the number of nudges available. Then by pressing keys *1*, *2* or *3* again the reels are nudged until a win occurs or your quota has been used. There is also the option to cancel holds and remaining nudges. If required instructions are displayed as necessary.

Listing 1 is the main program and should be typed in first and then Run to *Save*. After *Verifying* it, stop the tape and type in listing 2. When Run, this program will *Save* the user defined graphics, arrays a$ and c, and screen, and these should be *Saved* on tape just after the main program. Finally the program will *Save* itself as a precaution. Everything should now *Load* automatically.

**Notes:**

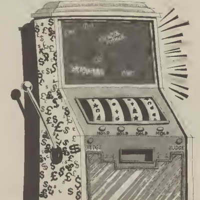
*Listing 1*

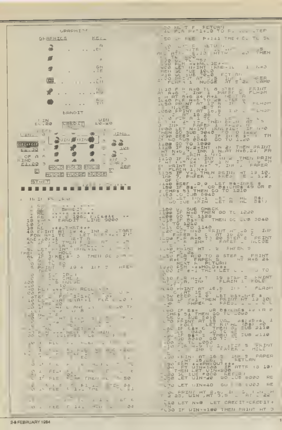
| Lines | |
|---|---|
| 10 | Saves the program to run automatically on loading |
| 20 110 | Start the game and take it through the various subroutines |
| 500-540 | A series of For Next loops to rotate the reels and to check which parts of the arrays (a$ and c) are in use |
| 700-800 | Since SCREEN$ cannot be used for distinguishing user defined graphics on the screen the display file is PEEKed to check for a win |
| 900 1250 | Nudge subroutine. Line 900 determines if there is to be a nudge. Lines 1000 1100 determine the number of nudges and lines 1120 1250 count the nudges used and check which keys are pressed |
| 2000-2130 | Hold subroutine, checking keys pressed and taking the appropriate action |
| 6000-6260 | Win subroutine, working out the win and new credit total |
| 6300 6320 | Play tune during win |
| 7000-7040 | Reduce credits and check if there are any left |
| 8000-8030 | End of game subroutine |
| 8040-8050 | Clear instructions |
| 9000-9100 | Load graphics, arrays and screen. Set up the variables and give the options of instructions. Poke 23658, 8 sets Caps Shift on |



*Listing 2*

| Lines | |
|---|---|
| 10-430 | Draw Screen. This includes six user defined graphics in line 280 which are graphics ABC and DEF respectively. The graphics in lines 350-400 are part of the main graphics and shown below, and those in line 120 are alternating graphic 8s and shifted graphic 8s |
| 500-570 | Define user graphics using one For Next loop |
| 600 740 | Set up arrays defining the reels. For graphics see below |
| 750-780 | Save relevant parts of the program |
| 790 | Saves the program itself |




GRAPHICS
GRAPHICS
KEY
BANDIT
WIN
CREDIT
WIN
WINS
HOLD
HOLD
HOLD
NUDGE
NUDGE
NUDGE
START

# martech games ...a spectacular range of software

## BLASTERMIND — SPECTRUM 48k £5 95

At first glance this might seem to be just another version of a very popular game How wrong can you be!!! At the start is simple enough The Spectrum picks a code of numbers or colours with a selection of levels of difficulty — and invites you to do the same You then take it in turns to guess each others code from the clue supplied after each guess An extremely well written fast and very clearly displayed game with almost inevitable defeat

This was exactly as intended but unfortunately *something* went wrong During the programming strange uncomplimentary messages began to appear on the screen At first they were so few they were not taken too seriously but soon they could no longer be ignored Somehow the Spectrum had been given a personality — a rather devious supercilious dislikeable hateful horrible mind

✱ Side B contains a version of the game compatible with the excellent Currah µSpeech unit — even worse!! ✱

## THE QUEST OF MERRAVID — VIC 20 (16k) £7 95 or Commodore 64 £7 95

A really challenging and enjoyable adventure written by a confirmed adventure addict who grew tired of the ease with which he solved other adventures himself Will accept and act on sentences containing up to nine words

The adventurer becomes Merravid charged with the task of finding taking and then returning the magic Firestone of the Dwarves However overcoming the many novel and original hazards is no easy matter Careful and imaginative thought is required if progress is to be made and the Firestone tracked down to the lair of the Dragon of Thargon Even then the Dragon has to be defeated and the stone retrieved A compulsive extremely enjoyable and very user friendly adventure

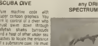
## HARRIER ATTACK — any ORIC - 1 £6.95, any SPECTRUM £5.95

Pure machine code super fast action packed highly addictive arcade-style game requiring great skill The harrier takes off from an aircraft carrier and flys over seaborne defenses to attack enemy installations on a nearby island The harrier may fly faster slower higher or lower and has bombs and cannon fire with which to protect itself and make its own attack If it flies too high it s detected by enemy jet fighters (which it may counter attack) — so it needs to hug the mountainous terrain which also varies with every new game But the island is heavily defended by anti aircraft rockets and tanks which again the harrier may counter attack or try to fly through A tally is kept of fuel speed altitude ammunition plus player score and high score Finally the harrier must make its bomb-run over the enemy base before returning past more hostile shipping to its own carrier



DURELL software

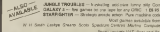
## SCUBA DIVE — any ORIC - 1 £6 95, SPECTRUM 48k £5 95



Pure machine code with super cartoon graphics You are in control of a diver who must swim down through jellyfish sharks barracuda and a host of other under sea nasties to locate the entrance of a submarine cave He must then follow its twisting and branching passages which change with every new game to locate the magical giant oysters with their fabulous treasure of enormous pearls Many of the passages lead to dead ends while some are filled with horrible underwater monsters Each dive has to be timed carefully so that there is enough oxygen left for the return journey which is further frustrated by the diver s boat shifting anchor and threatening to decapitate him with its propellor This game which features three divers player score high score hall of fame and sound effects presents perhaps the ultimate epic arcade adventure



DURELL software



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```
 INK 3,WIN/100 .00 AT 3,23
 100 .00
8040 IF WIN<100 THEN PRINT AT 3 [illegible]
8050 GO SUB 8300 IF CREDIT 9998 THEN LET CREDIT=100
8060 GO SUB 6070 GO TO 6090
8070 PRINT AT 4,14, INK 7, PAPER [illegible] 80.00 LET A=15 IF CREDIT>1000 THEN LET A=14
8150 PRINT AT 4,A INK 7 PAPER [illegible] CREDIT 100
8160 RETURN
8200 FOR A=5 TO 22 STEP 17 PRINT AT 4,A [illegible] ,AT 5,A, NEXT A
8230 RETURN
8300 FOR A=-24 TO 24 BEEP .02,A NEXT A FOR A=23 TO -24 STEP -1 BEEP .02,A NEXT A
8320 RETURN
8330 REM **NO WIN**
8400 LET CREDIT=CREDIT-10
8410 GO SUB 6070
8430 IF CREDIT=0 THEN GO TO 6900
8440 RETURN
8900 REM ***END OF GAME***
9000 GO SUB 6070 PRINT AT 19,10 INK 1 FLASH 1, PRESS ANY KEY T. BEGIN
9010 FOR N=0 TO -48 STEP -1 BEEP .03,N NEXT N
9020 PAUSE 0 PAUSE 0 LET CREDIT 100 PRINT AT 4,13 INK 7 PAPER [illegible] 101.00
9030 GO SUB 8040 RETURN
8040 PRINT AT 19,10, PAPER 1,
8050 RETURN
8990 REM ***INITIALISE***
9000 BORDER 1 INK 0 PAPER [illegible] CLS PRINT AT 11,10, FLASH 1 INK 2 PAPER 0; PLEASE WAIT
9010 LOAD CODE USR a LOAD DATA a$ LOAD DATA [illegible]
9020 DIM [illegible] POKE 23658 [illegible] LET credit=100
9030 FOR a=1 TO 3 LET d(a)=0 NEXT a
9040 LET a=1 LET hold=2000 LET nudge=900 LET spin=500 LET ch [illegible]
9050 PRINT AT 19,10 PAPER 1 INK [illegible] INSTRUCTIONS Y OR N
9060 IF INKEY$="Y" THEN LET [illegible]=1 GO TO 9100
9070 IF INKEY$="N" THEN LET [illegible]=0 GO TO 9100
9080 GO TO 9060
9100 RANDOMIZE GO SUB 8040 PRINT AT 19 10 INK 7 PAPER 1 [illegible] GO TO 40
```

GRAPHICS, ARRAYS & SCREEN

```
  1 REM Bandit Screen
 10 BORDER 1 PAPER 1 INK 9 [illegible]
 20 FOR a=5 TO 22 STEP 17
 30 FOR b=2 TO 3
 40 PRINT AT b,a, PAPER 7,
 50 NEXT b NEXT a
 60 PRINT AT 5,6, PAPER 5 ,AT 5,22
 70 FOR a=7 TO 24 STEP 17
 80 FOR b=6 TO 14 STEP 2
 90 PRINT AT b,a, PAPER 5
100 NEXT b NEXT a
110 PRINT AT 20,16, INK 5 [illegible]
120 [illegible]
130 PRINT AT 0 1 [illegible] BANDIT
140 PRINT AT [illegible] 101 [illegible]
160 PLOT [illegible]
170 FOR [illegible] 1 TO 1 [illegible] STEP [illegible]
190 FOR [illegible] TO 1E3 STEP 45
200 PLOT [illegible] 40 DRAW 11,0 DRAW 0 -9 DRAW [illegible] 41 0 DRAW 0 9 NEXT a
210 FOR [illegible] TO 207 STEP 168 PLOT a 40 DRAW 9 0 DRAW 0 -9 DRAW -9 0 [illegible] 0 9 NEXT a
220 PLOT [illegible] DRAW [illegible] DRAW -41 0 DRAW 0 [illegible]
230 INK 6 PLOT 71,1[illegible]0 DRAW 113,0 DRAW 0,-17 DRAW -113,0 DRAW 0,17
240 FOR a=10 TO 20 STEP 5 FOR b=6 TO 13
250 PRINT AT b,a PAPER 7 NEXT b NEXT a
260 DATA 0 0,0 0 0,66,66,66 0 0 [illegible]
270 LET p=PEEK 23675+256*PEEK 23676 FOR a=p TO p+47 READ b POKE a,b NEXT a
280 FOR a=12 TO 1, STEP 5 PRINT AT 7,a, [illegible] AT 8 a, [illegible] NEXT a
290 INK 5 PAPER 1 FOR a=9 TO 19 STEP 5 PRINT AT 15 a HOLD NEXT a
300 FOR a=8 TO 20 STEP 6 PRINT AT 17 a, NUDGE NEXT a
310 PRINT AT 16,[illegible] [illegible] AT 16,26.
320 PRINT AT 19,4 START
330 GO SUB 500
340 PRINT AT 6,1, [illegible] AT 6,1 [illegible] 1
350 PRINT AT 8,0 INK [illegible] PAPER [illegible] AT 9,0, [illegible]
360 PRINT AT 10,1, [illegible].00 AT 10 1, OVER 1,
370 PRINT AT 12 0, [illegible] OF A AT 13 0 KIND AT 14 1, [illegible].00 AT 14 1, OVER 1,
380 PRINT AT 8,26 INK 4, [illegible] AT 9,26 INK [illegible]
390 PRINT AT 10 2[illegible] [illegible] AT 10 [illegible] OVER 1
400 PRINT AT 11 26, INK 4, [illegible] AT 11 [illegible] INK 2,
410 PRINT AT 13,26, [illegible] AT 14,26, BARS AT 15,29, TOP AT 1[illegible],29, OVER 1,
420 INK 9
430 GO TO 600
500 REM Graphics
510 FOR a=p TO p+167 READ b POKE a,b NEXT a
520 DATA 0,112,252 [illegible] 69 [illegible] 1,3,6,4,7 [illegible] 1,0 [illegible] 247,255,254,220,0 0,[illegible] 248,248,248,[illegible] 248 [illegible] 0 0,0 15,31,[illegible] 0 0 0 [illegible] 0 15,15,13
530 DATA 1 2,120 252 [illegible] 25 [illegible] 99 [illegible] 157,172,[illegible] 255 [illegible] 255 [illegible] 99,103,107 [illegible] 255 0 255 [illegible] 1 3 3 [illegible]
540 DATA 0,0,[illegible] 184 60,2[illegible] 252 [illegible] 123,61,30,63 95,[illegible] 174,192 [illegible],0,[illegible] 0 [illegible] 31 [illegible] 1[illegible],12 [illegible],64 240 [illegible] 252 254,254,254,127 127 127,[illegible] 14 0 0,254 254 252 255 240 [illegible]
550 [illegible]
560 RETURN
600 REM Reels
610 DIM a$(20 3 2 [illegible] DIM [illegible] 20 3)
620 REM Reel 1
630 DATA [illegible]
640 REM Reel 2
650 DATA [illegible]
660 REM Reel 3
670 DATA [illegible]
680 FOR a=1 TO 3 FOR b 1 TO 20
690 READ a$(b a) TO [illegible]
700 NEXT b NEXT a
710 PAPER 7
720 FOR a=1 TO 3 FOR b 1 TO [illegible]
730 PRINT AT b+5,a+5+5 INK [illegible] a$(b,a) TO [illegible]
740 NEXT b NEXT a
750 SAVE GRAPHICS CODE USR a
760 [illegible]
760 SAVE REELS DATA a$()
770 SAVE COLOUR DATA [illegible]
780 SAVE SCREEN SCREEN$
790 SAVE SCREENPLOT
```

# Enter the Dragon

***Brian Cadge** picks his way through a New Yaar selection of Dragon software*

At the recent Christmas lair at Wembley a lot of new Dragon software was on display, not least from Dragon Data themselves who have recently released new titles in new style packaging Most of these titles have been licensed from US software houses which write for the Tandy Coco and the two featured here are no exception

*Shaft* is a game originally written by Prickly Pear Software which includes high resolution colour grahics and a little sound The game begins by requesting skill level to be entered via the joystick — there are only two levels and these don't differ a lot The title display is only black and white but is a very impressive use of mode 4 graphics

On to the game itself Across the screen are eight lifts, moving up and down at various speeds Your job is to negotiate the lifts avoiding all but the last one which is yellow and which moves you up to the next floor The sound effects are a bit half-hearted but the grahics (mode 3) are not bad especially the player's cowboy (why he is a cowboy is not made clear) If you do manage to reach the top right hand corner of the screen a parachute opens to bring you back to the bottom to start all over again

Although *Shaft* is quite an original game and enjoyable at the beginning the novelty soon wears off when you realise that getting to the top depends more on the random arrangement of lifts than on the player's skill The graphics could be a little less fuzzy and so could the sound

The second game featured here from Dragon Data is *Cmeeon Moon* The back of the box enthuses A real time sci fi adventure set in deepest space — fantastic 3D grahics and surrealistic sound effects create this weird and wonderful experience

Well you'll have to use your imagination a bit to go that far as this is yet another 3D maze game! Escaping from your cell on the alien ship, you roam the many corridors collecting laser guns etc hoping ultimately to find the way out Joysticks cannot be used as all commands are entered via the keyboard as in *Open Take, Search* etc The main problem I had was that I couldn't pick up anything — typing *Take Lasergun* when one is hanging on the wall resulted in nothing happening! Maybe I am missing something, which is not surprising as the manual is not exactly detailed

The sound effects are quite good but as in *Shaft*, the graphics could have been better and they are nowhere near as smooth as *Escape* the 3D maze game from Microdeal

Dragon Data's new packaging is in giant 7" × 9 plastic boxes with full colour inlays manuals and space for two cassettes and a disc This is certainly impressive, especially when the games are still only £8 each but remember it is the software not the packing that counts!

*Castle Attack* from M & D Systems is another arcade game using hi res colour graphics but very little sound The program is a hybrid of Basic and machine code which seems to run at quite an aceptable speed

Side one of the tape contains only instructions and title screens while side two contains the game itself The graphics are quite outstanding, my only grumble is that the keyboard has to be used with no option for joysticks The object of this game is to guide our hero round the castle walls collecting three coloured keys in the correct order and avoiding the barrels being tossed at him from the battlements and the arrows from the windows

Once all three keys are collected you enter the castle to rescue the princess To do this, our hero is confronted by yet another version of *Mastermind* using shapes instead of colours After such a good start to the game it was disappointing to find this as the finale If he fails to find the correct combination in time the princess gets the knife if he succeeds the game restarts

*Castle Attack* seems to have been hastily finished off a bit more sound a better end to the game and an option for joysticks would make this very good game into an excellent one In any case at the reasonable price of £6 50 this piece of software is still a worthwhile buy

*Super-Spy* is a "modern history simulation in the Cheshire Cat educational series It contains two double-sided cassettes neatly packed with an instruction



card The front of the box has the familiar red Dragon logo with the usual wording and looks more like a Dragon Data program than bona fide Dragon ones do!

Part one of the software starts with an assault course in black and white graphics in which you must duck and jump over various obstacles to get on to the next section of the program where facts about wartime Britain are thrown at you followed by ten questions for the 11-year old to answer Get five right and you go on to the parachute game This particular game section has got to be the most boring and monotonous of its type I have ever seen If you stick it out a code letter is given to help you later on in your secret mission The programs continue in a similar vein from here on

By now you will have realised that these programs attempt to educate youngsters while keeping them interested with games in between the facts Unfortunately the games are of a very low standard indeed and would have trouble keeping a five year-old amused let alone an average 11 year-old

*Super-Spy* is a good idea which could have been rather better In its present form the average parent will not want to pay out £20 for it

For those users who love playing maddening word puzzles in newspapers where a number of words are hidden in a word grid there is *Searchword* from Temptation Software The program allows

words from three to 12 letters to be entered and will then produce a word grid for you to play on. The words can be saved and loaded from cassette and there is also an option to list the concealed words if you forget them.

Not perhaps a game that will appeal to everyone, but if you like doing word puzzles, this program should be of interest to you.

The only way of classifying the next game is to call it a sort of strategy simulation for *UXB* from Virgin Games is a very original idea. Essentially the idea is to defuse an old wartime bomb. There is a choice of six tools from 12 to take along; these include hammer, spanners, pliers, screwdrivers etc. The game consists of a number of set stages, most involving choosing which action to do next with what tools. Making one wrong move causes the bomb to explode. A nice feature of the game is that if you do get killed, you can restart the game from that point.

High resolution colour graphics are used to display the bomb and its circuits from all angles as the game progresses. Graphics also form part of the action in two sections of the defusing cycle, together with the arrow keys to move detonator out.

Typing *Help* will sometimes give you a clue as to what to do next and *Tools* will list what you have with you. The game is written in Basic with some machine code routines from various magazines (including *PCW*) for handling the text, sound and autorunning the program.

Mastering the game is really a matter of patience, trial and error. Of course, once you have found the correct method of defusing the bomb (which took me about two hours to find) the game loses all of its appeal as there is no random element in the program.

Unfortunately, there are a number of bugs in the program. For example, if one chooses to use the same tool twice the program counts it as two tools. The restart option doesn't always work correctly, there is a simple way to cheat on the first graphic section and on the minefield you can walk straight through mines. Finally, as the program uses nearly all the memory, it occasionally crashes with an *Out of Memory* error.

With this number of bugs you will probably not be too keen on *UXB* but don't be put off. The program makes a refreshingly original change from run-of-the-mill adventures or arcade games, and a 32K program with good graphics and sound for £7 is worth a second look at least.



Finally in this review are two games from Softek. *Monsters* is yet another version of *Space Panic*, also available on the Dragon in versions called *Bonka* and *Cuthbert goes Digging*. In case you aren't familiar with this game, it involves guiding a small figure up and down ladders, bashing holes in the floor for the baddies to fall through before they get you. Also you are running out of air all the time. In this version of the game, you do not need to bash the robot on the head to make him fall, as in the original arcade game.

*Monsters* is a good version of this classic game, which uses the keyboard only, as does *Bonka*, and is similarly priced to the other versions mentioned.

So it is really a matter of taste and whether or not you want to use joysticks as to which you choose.

As has become traditional, I have left by far the best game until last. *Ugh*, also from Softek, is certainly one of the best arcade games to be released for the Dragon.

*Ugh* is a caveman, whom you control via joystick or keyboard, who knows that with the coming of the ice age he must stock his cave with food. Stealing eggs from the pterodactyl's nest at the top of the mountain seemed a good idea until pterry arrives dropping boulders on poor *Ugh*. To top it all, along plods Rex, a giant tyrannosaurus to aid pterry by chasing and jumping on *Ugh*.

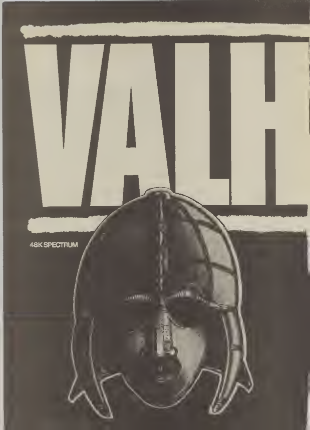
Armed with only a spear, which *Ugh* drops when he gets an egg, he must climb the mountain to the nest, get an egg and get it back to his cave, avoiding pterry and Rex, and if possible killing them for bonus points.

A bonus *Ugh* is awarded for every 5 000 points on the first screen and every 10 000 on the screen. At 10 000 points you move on to the next screen, which is a harder route up the mountain. Each screen contains 16 integral skill levels. A demo game is available on loading to give you the idea and show you all three screens.

The graphics in this game, which are in mode 3, show just what can be done with a lot of effort by the programmer and the animation is rivalled by no other game that I've seen. The sound is also a strong part of this piece of software. For originality and graphics, *Ugh* surely beats Microdeal's *The King*, but lacks as many different screens. At £7, this is the best game for the Dragon in a long time and with the option of joystick or keyboard, and the ability to be easily transferred to disc, it is a must for every user's game collection.

Looking at this batch of software, it is evident that the general standards are still rising slowly but surely. It is particularly good to see Dragon Data making an effort to get in on the software market once again. ■

| Supplier | Program | Price | Value (1-10) |
|---|---|---|---|
| Dragon Data<br>Kenfig Industrial Estate<br>Margam<br>Port Talbot<br>W Glamorgan | *Shaft*<br>*Crimson Moon* | 7.95<br>£7.95 | 8<br>6 |
| M & D Systems<br>39 Sheridan Road<br>Frimley<br>Surrey GU16 5DU | *Castle Attack* | £6.50 | 7 |
| Ampalsoft<br>PO Box 19<br>Knutsford<br>Cheshire WA16 0HE | *Super-Spy* | £ 8.95 | 5 |
| Temptation Software<br>56 Poland Street<br>London | *Searchword* | | 7 |
| Virgin Games<br>61-63 Portobello Road<br>London W11 | *UXB* | 6.95 | 7 |
| Softek<br>329 Croxted Road<br>London SE24 | *Monsters*<br>*Ugh* | £6.95<br>£6.95 | 7<br>10 |



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# Search and find

***Ron Luxton** demonstrates how to store and list recorded programs*

After the honeymoon period with my ZX81 I quickly found that I needed an orderly way of listing my increasing number of recorded programs or I would have to spend hours searching through a motley collection of tapes each time I needed one.

The answer for me has been to use one side of a C10 or C12 cassette for each program recording each one two or three times and to store the tapes in the special stackable drawer units made for the purpose. These are often advertised at reasonable prices and can be added to as required.

Another way is to store programs on longer tapes — C60 or C90 — recording each program two or three times in succession. This is cheaper but does require a recorder with a tape counter to make searching along the tapes a practical proposition.

*Program List* for the ZX81 (16K) is designed for use with either method of storage and provides an opportunity to search for your programs either by number or by name. It has the added facility of obtaining a print-out via the ZX printer of a complete list in either numerical or alphabetical order should you require one.

It will allow you to list and search for your programs under three main headings Games, Utility and Programming and a 'Special Instructions' entry to enable a single character code to be entered against programs for whatever purpose you want — to identify those programs in machine code, confidential files or perhaps merely to identify your favourites.

*Program List A* is intended for users of single tapes for each program, while *Program List B* is for use where many programs are recorded one after another on longer tapes. The second program is a list of the line changes to convert *Program List A* to *Program List B*.

*Program List B* additionally allows entries for the number of each tape and the position on the tape of each program. It will search for and list these numbers and both programs will list all entries with the same name such as *Bank Account* but will separately identify *Bank Account 1* from the rest if this is called for.

The program in Basic makes plentiful use of inkey$ for rapid access and only the alphabetical order call which puts the entries through a sort, takes any appreciable time. To limit this to 60 seconds or so it will search through only the first three letters and three digits of the number of each line (line 1300). This may mean that *Analysis* appears above *Anagram* for example but is a small price to pay for a rapid sort. Some of the multiple instructions lines are long — lines 580, 630 and 1090 — and care should be taken to enter

```
  10 REM  PROGRAM LIST
  20 REM ================
  30 REM    SET UP FILE
  40 REM ================
  50 GOTO 530
  60 DIM A$(100  2)
  70 FAST
  80 LET A=0
  90 FAST
  95 IF A>100 THEN GOTO 635
 110 LET A=A+1
 140 FAST
 150 CLS
 160 SCROLL
 170 PRINT  PROGRAM NUMBER ,TAB
1  A
 180 LET P$=STR$ A
 190 LET P$=(    +P$ AND VAL P$<
.9)+(    +P$ AND VAL P$<=10 AND
AL P$<-99)+(P$ AND VAL P$>=100)
 200 SCROLL
 210 PRINT  PROGRAM NAME?
 220 INPUT N$
 230 IF LEN N$>24 THEN GOTO 270
 240 IF N$=   THEN GOTO 160
 250 IF N$=     THE  LET N$=

 260 IF N$= END  THEN  OT  ~30
 270 SCROLL
 280 PRINT N$
 290 SCROLL
 300 PRINT  PROGRAM CATEGORY YE
~
 310 INPUT C$
 320 PRINT AT 21 2   C$
 330 SCROLL
 340 PRINT  SPECIAL INSTRUCTIONS
(EY?
 350 INPUT  $
 360 PRINT AT 20 16,X$
 370 LET A$(A)(1 TO LEN N$)=N$
 390 LET A$(A)(LEN N$+1 TO 23)=
 .. .  .. . . . ... ...
 400 LET A$(A)(28 TO 26 =P$
 410 LET A$(A)(30)=C$
 420 LET A$(A)(31)=X$
 430 CLS
 440 SCROLL
 450 PRINT A$(A)
 460 SCROLL
 470 SCROLL
 480 PRINT  IS THIS O K. (Y N)?
 483 IF A=100 THEN GOTO 635
 490 SLOW
 500 IF INKEY$<> ) AND INKEY$<
N  THEN GOTO 500
 510 GOTO (90 AND INKEY$= Y )+(1
40 AND INKEY$= N )
 520 REM ================
 530 REM       MENU
 540 REM ================
 550 FAST
 560 CLS
 570 PRINT AT 0,4  PROGRAM LIST
AT 0 15, [illegible]
 580 PRINT AT 2   M TO SET UP F
ILE ,AT   [illegible] THIS CLEARS PRE
[illegible]  AT 4   [illegible] INSTRUCT
IONS  AT 5 2  [illegible] CALL   PROGRAM N
UMBER  AT 6 2  [illegible] CALL  PROGRAM
NAME  AT 7 2  [illegible] CALL  PROGRAM C
ATEGORY ,AT 8 2, [illegible] CALL  SPECIA
L INSTRUCTIONS  AT 9 2 [illegible]   MAK
E FURTHER ENTRIES  AT 10 2 [illegible]
[illegible]  ...   ) 11,2 [illegible] NUMBE
R ORDER  AT 12 2 [illegible] ALPHABETICAL
 ORDER  AT 13,2 [illegible] TO SAVE PROGR
AM
 590 PRINT AT 19,6 [illegible] SELECT A L
ETTER [illegible]
 600 SLOW
 610 IF INKEY$=   THEN GOTO 610
 620 LET Q$=INKEY$
 630 GOTO (60 AND INKEY$= A )+(1
650 AND INKEY$= B )+(680 AND INK
EY$= C )+(860 AND INKEY$= D  +(
60 AND INKEY$= E )+(880 AND INKE
Y$= F )+ 140 AND INKEY$= G )+(16
10 AND INKEY$= H    1  0 AND INK
EY$= I  +(1   0 AND INKEY$= J )
 635
  0 PRINT AT 10 1  FILE FULL FI
LE FULL FILE FULL
 6
 650 REM ================
 660 REM    SEARCH ROUTINES
 670 REM ================
 680 FAST
 690 C
 700 PRINT  ENTER DETAILS
 710 INPUT Z$
 720 C
 7 0 LET   LEN Z$
 750 IF   =1 THEN LET Z$=     Z$
 760 IF   =2 THEN LET Z$=    Z$
 7 0 GOTO  780 AND Q$=
+(  Q$= D   +(860 AND Q$= E    ~
  AND  $   F )
 780 LET  =VAL Z$
 785 IF U>1 A THEN PRINT  NO ENT
S  FOR THIS NUMBER
 787 IF U+1 A THEN GOTO 1700
 790 PRINT A$(U)
 810 GOTO 1700
 820 LET X=0
 825 FOR B=1 TO A
 830 IF Z$=A$(B)(1 TO (1+    1)
HEN PRINT A$(B)
 835 IF Z$=A$(B)(1 TO (1+    1
HEN LET X=X+1
 840 NEXT B
 842 IF X >1 THEN GOTO 1700
 843 PRINT  NO ENTRY UNDER THAT
NAME
 850 GOTO 1700
 860 LET Z$=Z$(3)
 865 GOSUB 1500
 867 GOTO (   0 AND Q$= 3 )+
AND Q$= F )
 870 FOR B=1 TO A
 880 IF Z$=A$(B)(30) THEN PRINT
A$(B)
 885 NEXT B
 890 GOTO 1700
 892 FOR B=1 TO A
 894 IF Z$=A$ B)(30  THEN LPRINT
A$(B)
 895 NEXT B
```

them exactly as written

Before typing out the program decide how many titles you will finally want to store as this cannot be altered later although the full number of entries does not have to be entered at once and you can add to the list at any time. About 150 titles should fit comfortably within 16K. More may be squeezed in but the alphabetical sort soon runs out of memory beyond this number.

Line 60 should read *Dim A$ (number of entries 32)* and lines 95 and 483 should read *'IF A + (number of entries) Then Goto 635*

When the program has been entered, debugged and runs satisfactorily, *Save* it against accidental crashes enter *Run* and follow the instructions.

The program complete with your lists can be *Saved* and will automatically go to the menu on loading. Remember however that *Run* or *Clear* must not be used from now on or all the entries will be lost. If you need to restart the program enter *Goto 530*

If you need to change any of the entries later without effecting the rest of the list you should enter as a direct command the following *LET A$ (number of entry to be changed) = new program name*, full stops, numbers, letter code, etc with the spacing exactly as lines appear in the rest of the program press *Newline* and the new line will replace the old. If you get the spacing wrong then just try it again. ■

```
 900 IF O$= P  THEN GOTO 530
 910 LET Z$=Z$(3)
 916 GOSUB 1860
 917 GOTO (920 AND O$= S )+(942
AND O$= P )
 920 FOR B 1 TO A
 930 IF Z$=A$(B)(31) THEN PRINT
A$(B)
 935 NEXT B
 940 GOTO 1700
 942 FOR B=1 TO A
 944 IF Z$=A$(B,31) THEN LPRINT
A$(B)
 946 NEXT B
 948 IF O$= P  THEN GOTO 530
 950 GOTO 1700
 960 REM ====================
 970 REM CHECK LEN N$ ROUTINE
 980 REM ====================
 990 SCROLL
1000 SCROLL
1010 PRINT  SORRY 24 LETTERS ONL
  [illegible]
 [illegible] SCROLL
1130 GOTO 220
1140 REM ====================
 [illegible] REM  INSTRUCTIONS
 [illegible]
1170 FAST
 [illegible] CLS
 [illegible] PRINT  INSTRUCTIONS [illegible]
-------     ENTER TITLES AS RE
[illegible]  ENTER PROGRAM CATEG
[illegible]  PROGRAMMING,
[illegible] UTILIT [illegible] GA
ME[illegible] TO [illegible] ENTR LIST EN
[illegible] LEAVE TITLE E
[illegible] ENTER [illegible] SPACES. [illegible] USE
[illegible] CHARA[illegible] FOR [illegible] SPECIP
[illegible] ENTER
[illegible]
 [illegible] REM PRINT OUT AFTER SORT
 [illegible] REM ====================
 [illegible] FOR [illegible]
 [illegible] LET [illegible] E$(I+1 [illegible] TO 8)
 [illegible] IF [illegible] THEN PRINT A$(W)
 [illegible] IF [illegible] THEN LPRINT A$(W
 [illegible] NEXT [illegible]
 [illegible] IF [illegible] THEN GOTO 530
 [illegible] GOTO [illegible]
 [illegible] REM ====================
 [illegible] REM  SHELL ME[illegible]ER SORT
 [illegible] REM ====================
 [illegible] FAST
 [illegible] LET [illegible]
 [illegible] DIM [illegible]
 [illegible] DIM [illegible]
1290 FOR [illegible]
 [illegible] LET E$ I [illegible]A$(I (1 TO [illegible])+A$
I(1[illegible] TO [illegible]
 [illegible] NEXT
 [illegible] FOR [illegible]
 [illegible] LET [illegible]
1340 NEXT
 [illegible] LET
 [illegible] LET
 [illegible] LET M
 [illegible] LET N
 [illegible] IF [illegible] THEN [illegible] 1420
1400 LET M [illegible]
1410 GOTO [illegible]
1420 LET F [illegible]
1430 LET [illegible]
 [illegible] THEN [illegible] 1110
 [illegible] LET [illegible]
 [illegible] LET [illegible]
 [illegible] LET [illegible]
 [illegible] LET [illegible]
1490 IF E$(H) E$(E) THEN GOTO 1[illegible]
1500 LET [illegible] B+1
1510 IF [illegible] THEN GOTO 1430
1520 GOTO [illegible]
1530 LET [illegible]
1540 LET [illegible]=E$(H)
1550 LET E$(H)=E$(E)
1560 LET E$ E [illegible]
1570 LET H=H-P
1580 IF H<1 THEN GOTO 1500
1590 GOTO 1480
1600 REM ====================
1610 REM NUMBER ORDER PRINT OUT
1620 REM ====================
1640 FAST
1642 GOSUB 1860
1650 FOR B=1 TO A
1660 IF O$= S  THEN PRINT A$(B)
1670 IF O$= P  THEN LPRINT A$(B)
1680 NEXT B
1690 IF O$= P  THEN GOTO 530
1695 REM ====================
1700 REM ***RETURN TO MENU***
1702 REM ====================
1705 POKE 16418,0
1710 PRINT AT 23,0; KEY  M  FO
R MENU
1712 POKE 16418,2
1715 SLOW
1720 IF INKEY$<> M  THEN GOTO 17
20
1730 FAST
1740 GOTO 530
1760 REM ====================
1770 REM    SAVE ROUTINE
1780 REM ====================
1785 CLS
1790 PRINT  START RECORDER AND P
RESS  S
1800 SLOW
1810 IF INKEY$<> S  THEN GOTO 18
10
1820 SAVE  PROGRAM LIST
1840 GOTO 530
1850 REM ====================
1860 REM SCREEN OR [illegible]
1870 REM ====================
1880 CLS
1890 PRINT  SCREEN OR PRINTER?
1900 SLOW
1910 LET O$=INKEY$
1920 IF O$<> S  AND O$<> P  THEN
GOTO 1910
1930 FAST
1940 CLS
1950 RETURN

FOR PROGRAM LIST (B) -
(FOR LISTING A NUMBER OF
PROGRAMS ON LONGER
TAPES), DELETE THESE LINES
FROM LISTING FOR  PROGRAM
LIST (A) - (FOR LISTING
INDIVIDUAL TAPES) -

230  340  350   380  390  400
410  420  600   630  770  850
880  894  910   915  920  930
944  950 1010  1090 1300

AND ENTER THE FOLLOWING
LINES -
 332 PRINT  SPECIAL INSTRUCTIONS
?
 334 INPUT I$
 336 PRINT AT 21,[illegible] I$
 338 SCROLL
 340 PRINT  TAPE NUMBER?
 343 INPUT T$
 346 LET T$=( [illegible] +T$ AND VAL T$
<9)+( [illegible] +T$ AND VAL T$ >=10 AND V
AL T$<=99)+(T$ AND VAL T$>=100)
 349 PRINT AT 21,15 T$
 351 SCROLL
 355 PRINT  POSITION ON TAPE?
 358 INPUT X$
 361 LET X$=( [illegible] +X$ AND VAL X$
<9)+( [illegible] +X$ AND VAL X$>=10 AND V
AL X$<=99)+(X$ AND VAL X$>=100)
 363 PRINT AT 21,16 X$
 365 SCROLL
 375 LET A$ A) (LEN N$+1 TO 17)=
". . . . . . . . . . . . . . . . ."
 380 LET A$(A)(19 TO 21)=P$
 385 LET A$(A)(23)=C$
 387 LET A$(A)(24)=I$
 390 LET A$(A)(25 TO 27)=T$
 395 LET A$(A)(28)=
 410 LET A$(A)(29 TO 31)=X$
```

Continued on page 21

```
182 IF N=100 THEN ...
550 PRINT AT 2, ■ TO SET UP F
ILE ,AT ■ [illegible]
[illegible] AT 4,2 ■ INSTRUCT
... AT 5,2 ■ CALL - PROGRAM N
UMBER AT 6,2 ■ CALL - PROGRAM
NAME AT 7,2 ■ CALL - PROGRAM C
ATEGORY AT 8,2 ■ CALL - TAPE N
UMBER AT 9,2 ■ CALL - TAPE POS
ITION AT 10,2 ■ CALL - SPECIAL
INSTRUCTIONS AT 11,2 ■ TO MA
KE FURTHER ENTRIES AT 12,2 ■■
[illegible] AT 13,2 ■ NUMB
ER ORDER AT 14,2 ■ ALPHABETICA
L ORDER AT 15,2 ■ TO SAVE PROG
RAM
630 GOTO (100 AND INKEY$="A")+(1
050 AND INKEY$="B")+(660 AND INK
EY$="C")+(600 AND INKEY$="D")+(6
40 AND INKEY$="E")+(660 AND INKE
Y$="F")+(1660 AND INKEY$="G")+(66
0 AND INKEY$="H")+(1140 AND INKEY
$="I")+(1610 AND INKEY$="J")+(12
30 AND INKEY$="K")+(1270 AND INK
EY$="L")
770 GOTO (780 AND Q$="L")+(820
AND Q$="D")+(1880 AND Q$="E")+(91
0 AND Q$="F")+(950 AND Q$="G")+
(840 AND Q$="H")
840 LET Z$=Z$(3)
850 GOSUB 1260
851 GOTO (852 AND Q$="S")+(1855
AND Q$="P")
852 FOR B=1 TO A
853 IF Z$=A$(B)(24) THEN PRINT
A$(B)
854 NEXT B
855 GOTO 1700
856 FOR B=1 TO A
857 IF Z$=A$(B)(24) THEN LPRINT
A$(B)
858 NEXT B
859 IF Q$="F" THEN GOTO 830
860 IF Z$=A$(B)(23) THEN PRINT
A$(B)
894 IF Z$=A$(B)(23) THEN LPRINT
A$(B)
910 GOSUB 1550
920 LET X=0
925 FOR B=1 TO A
930 IF Z$=A$(B)(25 TO 27) THEN
PRINT A$(B)
932 IF Z$=A$(B)(28 TO 27) THEN
LET X=X+1
937 IF X=1 THEN GOTO 1780
938 PRINT "NO ENTRY UNDER THAT
NUMBER"
944 IF Z$=A$(B)(25 TO 27) THEN
PRINT A$(B)
950 LET X=0
951 FOR B=1 TO A
952 IF Z$=A$(B)(29 TO 31) THEN
PRINT A$(B)
953 IF Z$=A$(B)(29 TO 31) THEN
LET X=X+1
955 NEXT B
956 IF X=1 THEN GOTO 1700
957 PRINT "NO ENTRY UNDER THAT
NUMBER"
958 GOTO 1700
1010 PRINT "ERR, 17 LETTERS ONL
Y,TRY AGAIN"
1098 PRINT "INSTRUCTIONS ---
------ . ENTER TITLES AS RE
QUESTED. ENTER PROGRAM CATEGOR
Y AS P = PROGRAMMING
U = UTILITY, G = GAMES.
ENTER TAPE NUMBER AND PO
SITION ON TAPE AS MAXIMUM OF T
HREE DIGITS EACH. , USE ONE
CHARACTER ONLY FOR SPECIAL IN
STRUCTIONS CODE. , TO LEAVE EN
TRY LIST ENTER END , TO LEAVE
TITLE EMPTY ENTER TWO SPACE
S. ENTER M (OR GOTO 530)
TO RETURN TO MENU"
1380 LET D$(I)=A$(Y)(1 TO 3)+A$
(Y)(19 TO 21)
```

**Program List A**

NUMERICAL

```
DEC LOADER. ...........     1 P*
HEX LOADER.........         2 P*
LONDON BRIDGE.........      3 G$
ABOVE RAMTOP..........      4 P
MEMORY TEST...........      5 U$
EYEBALL...............      6 G
COMPILER..............      7 P*
LABEL MAKER...........      8 U
CHOMPER...............      9 G
PATIENCE..............     10 G*
HOUSEHOLD EXPENSES....     11 U£
BUSINESS EXPENSES.....     12 U£
CAR EXPENSES..........     13 U£
GRAND PRIX............     14 G
MORTGAGE..............     15 U£
CONVERSIONS...........     16 U
```

```
ALPHABETICAL

ABOVE RAMTOP ........         4
BUSINESS EXPENSES.....       12
CAR EXPENSES .........       13
CHOMPER...............        9
COMPILER .............        7
CONVERSIONS...........       16
DEC LOADER ...........        1
EYEBALL...............        6
GRAND PRIX............       14
HEX LOADER............        2
HOUSEHOLD EXPENSES....       11
LABEL MAKER...........        8
LONDON BRIDGE.........        3
MEMORY TEST ..........        5
MORTGAGE .............       15
PATIENCE..............       10

GAMES

LONDON BRIDGE.........        3
EYEBALL ..............        6
CHOMPER...............        9
PATIENCE..............       10
GRAND PRIX ...........       14

UTILITY

MEMORY TEST...........        5
LABEL MAKER...........        8
HOUSEHOLD EXPENSES....       11
BUSINESS EXPENSES.....       12
CAR EXPENSES..........       13
MORTGAGE..............       15
CONVERSIONS...........       16

PROGRAMMING

DEC LOADER............        1
HEX LOADER............        2
ABOVE RAMTOP..........        4
COMPILER..............        7
```

```
[illegible]
■ TO SET UP FILE
■ [illegible]
■ INSTRUCTIONS
■ CALL - PROGRAM NUMBER
■ CALL - PROGRAM NAME
■ CALL - PROGRAM CATEGORY
■ CALL - SPECIAL INSTRUCTIONS
■ TO MAKE FURTHER ENTRIES
■ [illegible].....
■ NUMBER ORDER
■ ALPHABETICAL ORDER
■ TO SAVE PROGRAM

■ SELECT A LETTER ■
```

**Program List B**

```
NUMERICAL

DEC LOADER.......     1 P*   1/  1
HEX LOADER.......     2 P*   1/ 38
LONDON BRIDGE....     3 G$   1/128
ABOVE RAMTOP.....     4 P    1/275
MEMORY TEST......     5 U$   1/322
EYEBALL..........     6 G    2/ 21
COMPILER.........     7 P*   2/ 89
LABEL MAKER......     8 U    2/185
CHOMPER..........     9 G    2/402
PATIENCE.........    10 G*   3/ 14
HOUSEHOLD EXPENSES   11 U£   3/ 58
BUSINESS EXPENSES    12 U£   3/144
CAR EXPENSES.....    13 U£   4/ 11
GRAND PRIX.......    14 G    4/182
MORTGAGE.........    15 U£   4/233
CONVERSION.......    16 U    5/ 18

TAPE NUMBER

CAR EXPENSES. ..     13 U£   4/ 11
GRAND PRIX     .     14 G    4/182
MORTGAGE. .  -       15 U£   4/233
```

```
[illegible]
■ TO SET UP FILE
■ [illegible]
■ INSTRUCTIONS
■ CALL - PROGRAM NUMBER
■ CALL - PROGRAM NAME
■ CALL - PROGRAM CATEGORY
■ CALL - TAPE NUMBER
■ CALL - TAPE POSITION
■ CALL - SPECIAL INSTRUCTIONS
■ TO MAKE FURTHER ENTRIES
■ [illegible].....
■ NUMBER ORDER
■ ALPHABETICAL ORDER
■ TO SAVE PROGRAM

■ SELECT A LETTER ■
```

# Addressed and labelled

***John Bradshaw** presents a word-processing program for editing and printing letters and articles*

I have found this program very useful for entering editing and printing letters notes for lectures orders of church worship and sermon outlines At the time when *WP* was written my only printer was the ZX hence the number 32 (ie the number of characters per line permitted by the printer) will be found in the program I imagine that if 32 were replaced by 65 or 80 the program could be used by the better printer

Text is inserted in the form of Data blocks at the end of the program Since each block is accessible (by Listing) and cannot be affected by alterations to other blocks editing and manipulation of the blocks is simple and safe! Hence, it is possible to delete alter, expand and move blocks freely

However the price to be paid for entering text as Data is that the Spectrum will accept only about 450 characters per Data entry So a paragraph on the ZX printer is limited to about 15 lines On the other hand it is possible to do some things that are not possible even on some expensive machine code disk based systems For example if the names and addresses to which a circular letter is to be sent are kept on tape as little blocks of data (ie as mini-programs within a reserved set of line numbers) each destination can be *Merged* with (*WP* + the letter) and the program will then print out a correctly addressed letter

Moreover since as will be seen later, any data items can be selected for printing on their own having inserted the address on the letter, an 'address label' can then be printed for the envelope before proceeding to the next destinee

The normal mode for entering text is one that uses 'word wrap' and right-justification This is the default mode — ie unless the user gives other instructions, *WP* will print proportionately spaced justified block of text A data entry which consists of # followed by a space will be printed without proportional spacing An entry which begins with @ followed by a space is printed at *Tab @*, and an entry beginning with c followed by a space will be centred

The main sections of the program are prefaced by REM statements to which the following notes refer

**Advice** When Run is *Entered* advice is given on the screen on how to enter text at Line 2000 ff This is followed by examples

**Main Menu** The user chooses the TAB value, single or double spacing and whether to *View* or *Print* Additionally the user may select up to 26 blocks of data to be printed in any order The user can also instruct the computer to number the blocks on the screen or on the print-out

**Proportional Spacing** Paragraphs are scanned line-by-line The ends of words are tagged and spaces are inserted after them progressively, until a line of 32 characters is formed This line is then printed A limiting device ensures that two or three words are not unduly expanded to fill the line The Subroutine (Lines 1230 to 1410) is slow, so that lines with proportional spacing are printed at about one per second Clearly this is where machine code would help On the other hand the fact that the whole program is in Basic enables the user to adapt it according to his or her need

**Menu** When the text has been viewed or printed, the variables are saved and the user can make alterations eg from single to double line spacing etc

I shall be happy to answer questions about *WP* or to provide copies of it on tape at £2 including postage any proceeds will go to charity Write to me at 2 Netherwood Close Solihull W Midlands

I usually *Merge WP* with my program *Relist* which renumbers the text (ie the Data blocks) in tens and/or my program *Delete* which deletes *WP* itself leaving only the text to be *Saved* I shall be glad to know how to improve *WP*, especially by using machine code for Lines 1320 to 1410 I forgot to say that one edits in exactly the same way as when writing programs ■

```
10 REM WPT
20 REM 36/582
30 POKE 23609 50
35 REM **ADVICE FOR USER**
40 PRINT "ENTER TEXT AS DATA AT LINE 2000 2010 ... LIKE THIS"
50 PRINT ,, "N.B. Where single [illegible] with SYMBOL SHIFT)."
[illegible]
[illegible] PRINT "2000 DATA [illegible]"
[illegible]
80 PRINT "[illegible] HEADING"
[illegible]
[illegible] LINE 20 TO RECORD THE NUMBER OF DATA ENTRIES & SOME NUMBER [illegible] THAN THE NUMBER OF CHARAC[illegible] IN THE LONGEST PARAGRAPH
110 INPUT "PROCEED [illegible]"
[illegible]
[illegible] INPUT "TABULATION Number [illegible]"
[illegible]
150 INPUT "SINGLE OR [illegible]"
[illegible]
[illegible] INPUT "NUMBER OF [illegible]"
[illegible]
250 INPUT [illegible]
```

```
240 INPUT ai: IF ai=0 THEN GO T
O 470
250 INPUT ag: IF ag=0 THEN GO T
O 470
260 INPUT ah: IF ah=0 THEN GO T
O 470
270 INPUT ai: IF ai=0 THEN GO T
O 470
280 INPUT aj: IF aj=0 THEN GO T
O 470
290 INPUT ak: IF ak=0 THEN GO T
O 470
320 INPUT al: IF al=0 THEN GO T
O 470
330 INPUT am: IF am=0 THEN GO T
O 470
340 INPUT an: IF an=0 THEN GO T
O 470
350 INPUT ao: IF ao=0 THEN GO T
O 470
360 INPUT ap: IF ap=0 THEN GO T
O 470
370 INPUT aq: IF aq=0 THEN GO T
O 470
380 INPUT ar: IF ar=0 THEN GO T
O 470
[illegible] IF as=0 THEN GO T
[illegible] IF at=0 THEN GO T
[illegible] INPUT au: IF au=0 THEN GO T
[illegible] IF av=0 THEN GO T
[illegible] IF aw=0 THEN GO T
[illegible] IF ax=0 THEN GO T
[illegible] IF ay=0 THEN GO T
[illegible] IF az=0 THEN GO T
[illegible] TEXT
[illegible]
```

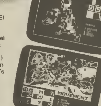
```
[illegible] IF i$(k) AND v$(n [illegible]
[illegible] THEN LPRINT TAB 0 [illegible]
[illegible] LPRINT [illegible] GO TO 1510
[illegible] REM **FINDS END OF [illegible]
[illegible] LET [illegible]
[illegible] LET [illegible] TO [illegible]
[illegible] DIM q(10)
900 LET k=0: LET [illegible]
[illegible] LET a=1
[illegible] LET [illegible]
[illegible] FOR p=1 TO 1
[illegible] IF v$(p [illegible] CHR$ 32 THEN LET
[illegible] LET a=a+1
[illegible] IF x=k THEN GO TO 960
[illegible] NEXT p
[illegible] LET L=0: LET a$=[illegible] LET b$=
[illegible] LET c$=[illegible] LET d$=[illegible] LET e$
[illegible] LET f$=[illegible] LET g$=[illegible] LET h
$=[illegible] LET i$=
970 IF v$(n,1) [illegible] THEN LET a$
$(n TO q(1))
980 LET m=1
990 IF q(m)=0 THEN LET z=m: GO
TO 1150
1000 IF q(m)<>0 THEN LET b$=v$(n
(q(m)+2) TO q(m+1))
1010 LET m=2: IF q(m)=0 THEN LET
z=m: GO TO 1150
1020 IF q(m)<>0 THEN LET c$=v$(n
q(m)+2) TO q(m+1))
1030 LET m=3: IF q(m)=0 THEN LET
z=m: GO TO 1150
1040 IF q(m)<>0 THEN LET d$=v$(
q(m)+2) TO q(m+1))
1050 LET m=4: IF q(m)=0 THEN LET
z=m: GO TO 1150
1060 IF q(m)<>0 THEN LET e$=v$(
(q(m)+2) TO q(m+1))
1070 LET m=5: IF q(m)=0 THEN [illegible]
[illegible] GO TO 1150
1080 IF q(m)<>0 THEN LET f$=v$(
(q(m)+2) TO q(m+1))
1090 LET m=6: IF q(m)=0 THEN [illegible]
z=[illegible] GO TO 1150
[illegible] IF q(m)<>0 THEN LET g$=v$(n
(q(m)+2) TO q(m+1))
1110 LET m=7: IF q(m)=0 THEN LET
z=m: GO TO 1150
[illegible] IF q(m)<>0 THEN LET h$=v$(n
[illegible])+2) TO q(m+1))
[illegible] LET m=8: IF q(m)=0 THEN LET
z=m: GO TO 1150
[illegible] IF q(m)<>0 THEN LET i$=v$(
[illegible] TO q(m+1))
[illegible] LET z$=a$+b$+c$+d$+e$+f$+g$+h
$
[illegible] LET L=LEN z$+[illegible]
[illegible] REM **LIMITS EXCEPTIONAL
        SPACING**
[illegible] IF a$=[illegible] AND b$=[illegible] AND [illegible]
[illegible] d$=[illegible] AND e$=[illegible] AND f$
[illegible] g$=[illegible] AND i$=[illegible] THEN GO TO
[illegible]
[illegible] IF a$=[illegible] AND [illegible] AND d$
AND e$ [illegible] AND [illegible]
[illegible] i$=[illegible] THEN LET [illegible]$=a$+
[illegible] 1420
[illegible] IF z [illegible] AND L [illegible] THEN [illegible]
[illegible] LET u$=CHR$ 32
[illegible] LET x=LEN (a$+b$+c$+d$+e$+
[illegible]$+h$+i$)
[illegible] IF x=22 THEN GO TO [illegible]
[illegible] REM **CENTERING**
[illegible] IF j$=[illegible] AND [illegible]
THEN PRINT TAB [illegible]
[illegible]$+CHR$ [illegible]
[illegible] CHR$ 32+[illegible]$+CHR$ 32[illegible]
[illegible]+CHR$ 32+CHR$ [illegible]
[illegible]
1224 IF j$=[illegible] AND [illegible]
[illegible] THEN PRINT TAB [illegible]
[illegible] CHR$ 32[illegible]$+CHR$ [illegible]
[illegible] CHR$ 32+f$+CHR$ [illegible]
[illegible] CHR$ 32+CHR$ 32[illegible] RETURN
[illegible] TO 1540
[illegible] IF [illegible] AND [illegible]
[illegible] THEN LPRINT TAB 16 INT [illegible]
[illegible] CHR$ 32+[illegible]$+CHR$ 32+d$[illegible]
[illegible]$+CHR$ 32+f$+CHR$ 32+[illegible]
[illegible]$+CHR$ 32+CHR$ 32+[illegible] TO 1
[illegible]
1228 IF j$=[illegible] AND [illegible]
[illegible] THEN LPRINT TAB 16 INT [illegible]
[illegible] CHR$ 32+c$+CHR$ 32+d$+[illegible]
[illegible]$+CHR$ 32+f$+CHR$ 32+g$+CHR$
[illegible]$+CHR$ 32+CHR$ 32+[illegible]
GO TO 1540
```

Continued on page 25



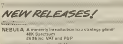

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```
[illegible] REM **PROPORTIONAL
          SPACING**
[illegible] IF [illegible] 32 AND [illegible] AND q [illegible]
    THEN LET a$=a$+u$ [illegible]
[illegible] IF k=32 THEN GO TO 1420
[illegible] IF [illegible] 32 AND q(3) [illegible] THEN LE
[illegible] LET k=k+1
[illegible] IF k=32 THEN GO TO 1420
[illegible] IF k[illegible]32 AND q(4) [illegible]0 THEN LE
[illegible] LET k=k+1
1200 IF k=32 THEN GO TO 1420
1250 IF k[illegible]32 AND q(5) [illegible]0 THEN LE
[illegible] LET k=k+1
1300 IF k=32 THEN GO TO 1420
[illegible] IF k<32 AND q(6) [illegible]0 THEN LE
[illegible] LET k=k+1
[illegible] IF k=32 THEN GO TO 1420
[illegible] IF k<32 AND q[illegible] THEN LE
[illegible] LET k=k+1
[illegible] IF k=32 THEN GO TO 1420
[illegible] IF k<32 AND q(8) [illegible] THEN LE
[illegible] LET k=k+1
[illegible] IF [illegible] THEN GO TO 1420
[illegible] IF k[illegible]32 AND q(9)<>0 THEN LE
[illegible] LET k=k+1
[illegible] IF k=32 THEN GO TO 1420
[illegible] IF k[illegible] AND q(8)<>0 THEN LE
[illegible] LET k=k+1
[illegible] IF [illegible] THEN GO TO [illegible]
[illegible] IF [illegible] AND [illegible] THEN GO TO
[illegible]
[illegible] REM **PRINT NO PARAGRAPHS*
[illegible] IF [illegible] THEN PRINT a$+b$+
[illegible]
[illegible] IF [illegible] THEN LPRINT a$+b$
[illegible]
[illegible] SPACING*
[illegible] IF [illegible] AND [illegible] THEN
[illegible]
[illegible] REM **SPACE BETWEEN
          PARAGRAPHS*
[illegible] THEN [illegible]
[illegible] THEN [illegible]
[illegible] THEN [illegible]
[illegible] REM **INDENTATION*
[illegible] THEN [illegible]
[illegible]
[illegible] 0 THEN [illegible]
[illegible] THEN [illegible]
[illegible] STORE [illegible]
[illegible] **MENU [illegible]**
[illegible] TAB [illegible]
[illegible] TAB 0 [illegible]
[illegible] TAB [illegible]
[illegible] TAB 0 [illegible]
[illegible] 60
[illegible] PRINT TAB 0 [illegible]
[illegible] 24 [illegible]
[illegible] PRINT TAB 0 [illegible]
[illegible] GOTO [illegible]
[illegible] TAB 0 TABULA[illegible]
[illegible] 150
[illegible]
[illegible] DATA [illegible]
[illegible] IF [illegible]
[illegible] THEN LPRINT [illegible]
[illegible] THEN [illegible]
[illegible] DATA [illegible]
[illegible] DATA [illegible]
[illegible]
[illegible] DATA [illegible]
[illegible] DATA [illegible]
[illegible] DATA # END
```


METAGALACTIC LLAMAS BATTLE AT
THE EDGE OF TIME
ATTACK of the MUTANT CAMELS


REVENGE
OF THE MUTANT CAMELS

# Curved slope

***Milosc Vsrsipellis** presents an envelope shaping program for the Commodore 64*

This program for the Commodore 64 allows the user to explore the SID chip's envelope shaping capability. It is written *top-down* style to isolate sub routines for use in other programs. The many lines with just a colon are to add readability; they are not necessary to the working of the program.

Four variables define the shape of the program by setting the *slope* of a curve. The numbers are coded logarithmically, so that a slope of two is twice a slope of one. This is necessary since human senses measure all input logarithmically. Since it is the slope that is being set in coded form a zero will still produce a slope.

As a clue to your experiments, the coded numbers 0 to 15 can be thought of as the length of time a particular phase lasts, so that you can hear the envelope effects. Perhaps you would like to try the following — they are given in order — Attack Decay Sustain Release

| | | | | |
|---|---|---|---|---|
| 10 | 10 | 10 | 0 | HARPlike sound |
| 10 | 15 | 0 | 0 | HARPSICHORDlike sound |
| 15 | 0 | 10 | 15 | A Great AMEN |
| 12, | 2 | 13 | 0 | A lesser Amen |
| 12 | 7 | 7 | 10 | Typical envelope natural |
| 8, | 4 | 2, | 1 | BANJOlike sound |

```
1 REM#####################
2
3 REM      THE ROYAL MAIL
4
5 REM  ENVELOPE SHAPING  EXPER
6
7 REM    BY MILOSC VERSIPELLIS
8
9 REM################################
10
20 GOSUB 9000  REM INITIALISE
30 GOSUB 8000  REM GET NYBBLES
40 GOSUB 7000  REM PLAY NOTE WITH RISE
50 GOTO20
90
4000
4001 REM      CHECK NYBBLE LIMITS
4002
4100 A=INT(A)
4110 FL=0
4120 IF A  0 OR A  15 THEN FL=1  PRINT
4990 RETURN
6000
6001 REM END - SHUT OFF VOLUME AND NOTES
6002
6010
6020 FORI=0TO24
6030  POKES1+I 0
6040 NEXT
6990 RETURN
7000
7001 REM        PLAY NOTE
7002
7003 REM VOLUME AND ATTACK  DECAY
7007
7010 GOSUB5000     REM SWITCH OFF SOUND
7020 POKES1+24 15 REM INITIALISE SOUND
7030 POKES1+5 ATT OR(DEC*16)
7040 POKES2+5,ATT OR DEC*16)
7050 POKES3+5,ATT OR(DEC*16)
7051
7060 REM SUSTAIN/RELEASE
7061
7070 POKES1+6 SUS OR(REL*16)
7080 POKES2+6 SUS OR REL*16)
7090 POKES3+6 SUS OR(REL*16
7091
7100 REM SET FIXED CHORD
7101
7110 POKES1+1 17
7120 POKES1,37
7130 POKES2+1 21
7140 POKES2 154
7150 POKES3+1 25
7160 POKES3 17
7161
7170 REM SET TRIANGULAR WAVE
7171
7180 POKES1+4 17
7190 POKES2+4 17
7200 POKES3+4 17
7201
7990 RETURN
8000
8001 REM GET NYBBLE VALUES
8002
[illegible]
8200 INPUT ATTACK NUMBER (0 - 15)
8210 GOSUB4000
8220 IF FLTHEN8200
8230 ATT=A
8240 PRINT
8260
8300 INPUT DECAY  NUMBER
8310 GOSUB4000
8320 IF FLTHEN8300
8330 DEC=A
8340 PRINT
8360
8400 INPUT SUSTAIN NUMBER (0 - 15)
8410 GOSUB4000
8420 IF FLTHEN8400
8430 SUS=A
8440 PRINT
8460
8500 INPUT RELEASE NUMBER (0 - 15);A
8510 GOSUB4000
8520 IF FLTHEN8500
8530 REL=A
8540 PRINT
8560
8990 RETURN
9000
9001 REM STARTING VARIABLES SET UP
9002
9010 S1=54272
9020 S2=S1+7
9030 S3=S2+7
9031
9040 REM DEFAULT VALUES
9041
9050 ATT=0
9060 DEC=0
9070 SUS=0
9090 REL=0
9100 HEADER$="+++++++ENVELOPE SHAPING  EXPERIMENT+++++"
9990 RETURN
10100 REM S1 S2 S3 ARE THE ADDRESSES OF
10110 REM THE  VOICE  REGISTERS  ON THE
10120 REM COMMODORE   64    SID  CHIP .
10200
10210 REM ATT DEC SUS REL ARE SHORT FOR
10220 REM ATTACK   DECAY  SUSTAIN   AND
10230 REM RELEASE WHICH  ARE  THE  MAIN
10240 REM COMPONENTS   OF   ENVELOPES .
10300
10310 REM THE NYBBLES MUST  BE  CHECKED
10320 REM TO ENSURE  THEY  ARE  BETWEEN
10330 REM THE VALUES ZERO  AND  FIFTEEN
10340 REM BECAUSE THEY  CONTROL  VOLUME
10350 REM WHICH HAS A MAXIMUM VALUE OF
10360 REM FIFTEEN   NOTE THE USE OF THE
10370 REM F   UP  FLAG  VARIABLE HERE .
11000 ##################################
11001
11002
11003 REM FOR THE COMMODORE 64  COMPUTER
11004
11005 ##################################
```



# New-Sinclair QL

## There's no comparison chart, b

The Sinclair QL is a new computer

Not just a new Sinclair computer but a totally new sort of computer – nothing like it exists anywhere

It's not just a bit better than this, or a bit cheaper than that – it's a computer that's very hard to compare with anything. Just check the features below – and if you don't agree, take up the challenge at the end of the advertisement.

If you do agree, there's only one course of action you can take: get yourself a Sinclair QL at the earliest possible moment.

### The Sinclair QL has 128K RAM. Big deal?

Several micros offer 128K RAM, or more, as standard. The 'What Micro?' table for December 1983 lists over 50 of them – but 40 of the 50 micros listed cost over £2 500!

The Sinclair QL offers you 128K RAM for under £400, and an option to expand to 640K. That's a lot of bytes to the pound!

### The Sinclair QL has a 32-bit processor. Who else?

Under £2 700 nobody. Even the new generation of business computers, such as the IBM PC, are only now beginning to use 16-bit processors.

At prices like this, the Motorola 68000 family – widely regarded as the most powerful microprocessors available – will remain a luxury.

Yet with the Sinclair QL, the 32-bit Motorola 68008 is available for less than £400.

You can also be sure that the QL will not become outdated. 32-bit architecture is future-proof.

**32-bit processor architecture, 128K RAM, and QDOS combine to give the QL the performance of a mini-computer for the price of a micro**

### Exclusive: new QDOS operating system

No competition! QDOS sets a new standard in operating systems for the 68000 family of processors, and may well become the industry standard.

QDOS is a single-user multi-tasking, time-sliced system using Sinclair's new SuperBASIC as a command language.

One of its most significant features is its very powerful multi-tasking capability – the ability to run several programs individually and simultaneously. It can also display the results simultaneously in different portions of the screen. These are features not normally available on computers costing less than £7 000.

**Eleven input/output ports**

QL ROM Cartridge slot

2x Joystick ports

2x RS 232-C

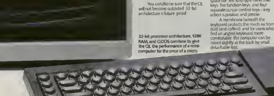
Expansion slot

### New professional keyboard

The QL keyboard is designed for fast input of data and programs.

It is a full size QWERTY keyboard with 65 keys, including a space bar, left- and right-hand shift keys, five function keys and four separate cursor-control keys – key action is positive and precise.

A membrane beneath the keyboard protects the machine from dust (and coffee!), and for users who find an angled keyboard more comfortable, the computer can be raised slightly at the back by small detachable feet.




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# Access to files

***Brian Cadge** looks at direct access on disc drives in the first of a two-part series*

Now that the Dragon disc drives are finally available in quantity more and more users who have paid out nearly £300 for this metal odx will be asking themselves 'Is it just a fast cassette recorder?' Although one of the main advantages of a disc drive is its speed the other major benefit is not so immediately obvious — the capability for sophisticated file handling

Cassette tapes have the disadvantage of being serial access only — that is record 2 can only be read after record 1 and so on But a disc drive is capable of random access that is reading any record you wish at random The file handling commands added with the DDS cartridge are easy to use and lend themselves to direct access filing although there is no provision for true random access from Basic as on some other drives

The program presented here illustrates the use of direct access files and should be of use to any disc drive owners who want to keep names and addresses or catalogue their programs etc To try and make it as easy to follow as possible the program is designed as a series of modules — easily spotted by the Rem lines Line 60 defines the important function which will simulate direct access files The Dragon disc drives allow a file to be created as it is written to but this is only suitable for serial data For our purposes the disc space must already have been reserved for the file in advance — similar to a *Dim* statement — and this is done by the first module Notice in line 310 that by the use of the *Free* function it is possible to avoid a possible error by checking that the disc space exists before attempting to *Create* the file in line 330

To read an entry from the file the user-defined function is used with the argument being the record number that we wish to read The length of the record L, must also be stated as well as the name of the file F$ see line 510 This program also allows you to enter a search string the program then searches through the whole file and prints any possible match that it finds — the *Instr* function is very useful here

Not only can we read from any record directly we can also of course write to any record and this is done by the module starting at line 800 The same format is used for the *Fwrite* command in line 880 as is used for the *Fread* command

Another very useful feature of the DOS Basic is error trapping The program is fully error trapped Any errors not found by the individual modules are handled by the error routine starting at line 1010 — the *Error Goto* command in line 70 points to this The most common errors for example caused by the user not inserting a disc properly are explained in full Others have their code number and line number displayed After an error has occurred control is passed back to the main menu

By not having any data in Ram except when required the files can be as big as disc space will allow up to 165K This program is only an example of file handling on the Dragon it is written in such a way as to be easily expanded I leave it up to you to customise it and add your own modules as you like for example a printer dump of the files contents

Next week we take a more technical look at Dragon's disc drives, including a memory map for the DOS and some DOS Rom routines of interest to the machine code programmer ■

```
10 'GENERAL PURPOSE FILE PROGRAM
20 'REQUIRES DRAGONDOS 1.0
30 '
40 CLEAR500
50 FLAG=0
60 DEF FNR(R)=(R-1)*L+20
70 ERROR GOTO 1010
80 CLS
90 PRINT'OPTIONS AVAILABLE ARE:'
100 PRINT
110 PRINT" 1  CREATE A NEW FILE"
120 PRINT" 2: EXAMINE ENTRIES IN FILE"
130 PRINT" 3: DELETE ENTRIES FROM FILE"
140 PRINT" 4: ADD AN ENTRY TO FILE'
150 PRINT" 5: CHANGE CURRENT FILE IN USE'
160 PRINT
170 IF FLAG=0 THEN PRINT"NO FILENAME -
    SELECT 1 OR 5." ELSE PRINT'FILE IN
    USE IS "F$
180 PRINT
190 BEEP:PRINT@453,'ENTER OPTION NUMBER ',
200 INPUT OP$ OP=VAL(OP$) IF OP<1 OR OP
    >5 OR OP>INT(OP) THEN 190
210 IF FLAG=0 AND (OP<>1 AND OP<>5) THEN
    190
220 ON OP GOTO 230,400,670,800,920
230  ****************
240 'CREATE A NEW FILE
250 '****************
260 CLS:PRINT"CREATE A NEW FILE.":PRINT
270 INPUT 'NUMBER OF RECORDS";N
280 IF N<1 THEN 270
290 INPUT 'LENGTH OF EACH RECORD';L
300 IF L<1 THEN 290
310 IF (FREE1)+1024<(20+L*N) THEN BEEP:
    PRINT:PRINT'NOT ENOUGH DISK SPACE!"
    :WAIT5
000 GOTO70
320 LINE INPUT "FILENAME:";F$
330 CREATE F$,20+L*N
340 N=0
350 FWRITE F$,FROM 0;N
360 FWRITE F$,FROM 10;L
370 BEEP:PRINT:PRINT"FILE "F$' CREATED"
    :FLAG=255
380 PRINT"DISK SPACE USED =";LOF(F$+".
    DAT')
390 WAIT 5000:GOTO70
400 '****************
410 'EXAMINE AN ENTRY
420 '****************
430 CLS
440 INPUT "EXAMINE ALL ENTRIES (Y/N)';A$
450 IF A$="Y" THEN 620
460 CLS
470 PRINT "ENTER RECORD NUMBER OR SEARCH
    STRING:"
480 LINE INPUT S$
490 R=VAL(S$)
500 IF R=0 THEN 570
510 FLREAD F$,FROM FNR(R),FOR L;A$
520 CLS
530 PRINT'RECORD NUMBER";R
540 PRINT
550 PRINTA$
560 PRINT:PRINT"PRESS ANY KEY":EXEC41194
    :GOTO70
570 FOR I=1 TO N
580 FLREAD F$,FROM FNR(I),FOR L;A$
590 IF INSTR(1,A$,S$)<>0 THEN PRINT"
    RECORD NUMBER';I:PRINTA$ PRINT:BEEP
```

```
600 NEXTI
610 GOTO560
620 CLS
630 FORI=1 TO N
640 FLREAD F$,FROM FNR(I),FOR L;A$ PRINT
    I;A$
650 NEXTI
660 GOTO560
670 '*************************
680 'DELETE AN ENTRY FROM FILE
690 '*************************
700 CLS
710 BEEP:INPUT "RECORD NUMBER TO BE
    DELETED";R
730 FLREAD F$,FROM FNR(R),FOR L;A$
740 PRINT:PRINT"DELETE:":PRINTA$
750 INPUT"DELETE (Y/N)";Z$
760 IF Z$<>"Y" THEN BEEP:PRINT"ABANDONED
    ":WAIT5000 GOTO70
770 FWRITE F$,FROM FNR(R),FOR L;"  "
780 IF R=N THEN N=N-1:FWRITE F$,FROM 0;N
790 GOTO70
800 '*****************
810 'ADD ENTRY TO FILE
820 '*****************
830 CLS
840 INPUT "RECORD NUMBER";R
850 IF R<1 THEN 840
860 PRINT:PRINT"ENTER TEXT"
870 PRINT:LINE INPUT A$
880 FWRITE F$,FROM FNR(R),FOR L;A$
890 IF R>N THEN N=R:FWRITE F$,FROM0;N
900 INPUT "ADD ANOTHER (Y/N)";A$
910 IF A$="Y" THEN 800 ELSE 70
920 '*******************
930 'CHANGE CURRENT FILE
940 '*******************
950 CLS
960 LINE INPUT "FILENAME>";F$
970 FREAD F$,FROM0;N
980 FREAD F$,FROM10;L
990 FLAG=255
1000 GOTO70
1010 '**********************
1020 'ERROR TRAPPING ROUTINE
1030 '**********************
1040 SOUND1,1
1050 IF ERR>=120 THEN PRINT"DISK ERROR"
     ELSE PRINT"ERROR IN BASIC"
1060 PRINT"ERROR"ERR;"AT LINE";ERL
1070 PRINT
1080 IF ERR=120 THEN PRINT"DISK NOT
     READY. PLEASE ENSURE   THAT DISK
     IS IN PLACE AND THE   HATCH IS
     CLOSED."
1090 IF ERR=150 THEN PRINT"YOU HAVE TRIED
     TO ACCESS A FILE THAT DOES NOT EXIST."
1100 IF ERR=154 THEN PRINT"YOU HAVE TRIED
     TO ACCESS A DATA RECORD THAT DOES
     NOT EXIST."
1110 IF ERR=162 THEN PRINT"THERE ARE TOO
     MANY FILES OPEN":CLOSE
1120 WAIT 5000:GOTO70
```

# Keyed up

***Michael Durrant** explains how to get 40 function keys on the BBC with 1.2 Rom*

This program enables you to set up the function keys on the BBC B such that you can get not the usual 10 but 40 different functions.

This facility is made possible by the new 1.2 *Rom* (and so will not work on machines with the old *Rom*) and using function keys in conjunction with different keys. The combinations are as follows:

1) Function keys on their own
2) Function keys with *Shift*
3) Function keys with *Control*
4) Function keys with *Control* and *Shift*

The important thing to note is that the additional 30 character definitions will survive not only a *Break* but also a hard-reset (*Ctrl—Break*). This means that once this program has been run and the characters defined another program can be entered (in *Mode 4* say) and the keys can be used to insert the definitions as one character, instead of the *Print Chr$ (224)* etc with the *Vdu* definitions at the beginning. ■

```
10 MODE7
20 PROCOFF
30 PRINTTAB(5,5);CHR$(141);CHR$(130);CHR$(157);CHR$(132);"FUNCTION KEYS SET UP ";CHR$(156)
40 PRINTTAB(5,6);CHR$(141);CHR$(130);CHR$(157);CHR$(132);"FUNCTION KEYS SET UP";CHR$(156)
50 VDU28,1,24,37,8
60 PRINT TAB(3);" NORMAL FN:"
80 PRINTTAB(4);"0. .UNUSED"
90 PRINTTAB(4);"1. .UNUSED"
100 PRINTTAB(4);"2. .LIST("
110 PRINTTAB(4);"3. .RUN("
120 PRINTTAB(4);"4. .*FX12,4L*FX11,75("
130 PRINTTAB(4);"5. .PRINTTAB("
140 PRINTTAB(4);"6. .=INKEY("
150 PRINTTAB(4);"7. .*KEY"
160 PRINTTAB(4);"8. .UNUSED"
170 PRINTTAB(4);"9. .UNUSED"
180 PRINTTAB(4);"10 .OLDL LIST"
190 *KEY2"LIST!M"
200 *KEY3"RUN!M"
210 *KEY4"*FX12,4!M*FX11,75!M"
220 *KEY5"PRINTTAB("
230 *KEY6"=INKEY("
240 *KEY7"*KEY"
250 *KEY10"OLD!MLIST"
260 PRINTTAB(5,14);CHR$(130);"PRESS ANY KEY FOR NEXT PAGE"
270 PRINTTAB(5,15);CHR$(148);STRING$(27," ")
280 A$=GET$
290 CLS
300 PRINT TAB(3);"  SHIFT FN:"
310 PRINTTAB(3);CHR$(145);"
320PRINTTAB(4);"0. .NO EFFECT"
330PRINTTAB(4);"1. .RED    ";CHR$(134);"  THESE KEYS ARE USED"
340PRINTTAB(4);"2. .GREEN ";CHR$134;"   IN MODE SEVEN"
350PRINTTAB(4);"3. .YELLOW";CHR$134;"   AND WHEN PRESSED"
360PRINTTAB(4);"4. .BLUE  ";CHR$134;"   WITH A SHIFT KEY"
370PRINTTAB(4);"5. .MAGENTA";CHR$134;"  GIVE COLOURS"
380PRINTTAB(4);"6. .CYAN";CHR$(134);"(USEFUL IN"
390PRINTTAB(4);"7. .WHITE ";CHR$134;"   IN PRINT STATEMENTS)"
400PRINTTAB(4);"8. .FLASH"
410PRINTTAB(4);"9. .STEADY"
420 PRINTTAB(5,14);CHR$(130);"PRESS ANY KEY FOR NEXT PAGE"
430 PRINTTAB(5,15);CHR$(148);STRING$(27," ")
440 A$=GET$
450 MODE1
460 PROCOFF
470 COLOUR1:PRINT        TAB(3);"CNTRL FN:"
480 COLOUR2:PRINTTAB(3);"**********
490 COLOUR3
500 *FX227,224
510VDU23,224,129,66,36,24,24,36,66,129
520VDU23,225,255,255,255,255,255,255,255,255
530VDU23,226,0,60,126,126,126,126,60,0
540VDU23,227,255,129,129,129,129,129,129,255
550VDU23,228,0,0,60,36,36,60,0,0
560VDU23,229,126,195,219,215,215,219,195,126
570VDU23,230,170,85,170,85,170,85,170,85
580VDU23,231,85,170,85,170,85,170,85,170
590VDU23,232,0,0,0,24,24,0,0,0
600VDU23,233,24,24,24,24,24,24,24,24
610 PRINT
620 PRINTTAB(9);"0. ";CHR$(224)
630PRINTTAB(9);"1. ";CHR$(225)
640PRINTTAB(9);"2. ";CHR$(226)
650PRINTTAB(9);"3. ";CHR$(227)
660PRINTTAB(9);"4. ";:COLOUR1:PRINT FOR MODES 0 TO 6";:COLOUR2:PRINT
670PRINTTAB(9);"5. ";CHR$(229)
680PRINTTAB(9);"6. ";CHR$(230)
690PRINTTAB(9);"7. ";CHR$(231)
700PRINTTAB(9);"8. ";CHR$(232)
710PRINTTAB(9);"9. ";CHR$(233)
720 COLOUR2
```

```
720 COLOUR2:PRINTTAB(8)"PRESS ANY
    KEY FOR NEXT PAGE"
740 COLOUR1:PRINTTAB(7):STRING$
    (29,"*")
750 A$=GET$
760 CLS
770COLOUR2:PRINT   TAB(7);  SHIFT
    & CNTRL FN:
780COLOUR1:PRINTTAB(7);"***********
    *******"
790 COLOUR2
800 *FX228,234
810VDU23,234,255,255,255,255,0,0,0,0
820VDU23,235,0,0,0,0,255,255,255,255
830VDU23,236,240,240,240,240,240,
    240,240,240
840VDU23,237,15,15,15,15,15,15,15,15
850 VDU23,238,240,240,240,240,0,0
    ,0,0
860 VDU23,239,15,15,15,15,0,0,0,0,
    15,15,15,15
870VDU23,240,0,0,0,0,240,240,240,
    240
880VDU23,241,0,0,0,0,15,15,15,15
890VDU23,242,1,3,7,15,31,63,127,254
900VDU23,243,128,192,224,240,248,
    252,254,255
910 FORN=0TO9
920 PRINTTAB(4);N;'.";:COLOUR2:
    PRINTCHR$(129);:COLOUR1:PRINT
    CHR$(234+N);:COLOUR2:PRINTCHR$
    (129) :COLOUR2:NEXT
930 PRINTTAB(17,10);"THE RED
    CHARACTERS"
940 PRINTTAB(17,11);"ARE THE
    CHARACERS"
950 PRINTTAB(17,12);"DEFINED AND
    THE"
960 PRINTTAB(17,13);"YELLOW BLOCKS'
970 PRINTTAB(17,14);"EMPHASIZE
    THEIR"
980 PRINTTAB(17,15);'POSITION ON A"
990 PRINTTAB(17,16);"CHARACTER CELL
1000 COLOUR1:PRINTTAB(18,19);' FOR
     MODES 0 TO 6"
1010 PRINT
1020 COLOUR2:PRINTTAB(8)"PRESS ANY
     KEY TO FINISH"
1030 COLOUR1:PRINTTAB(6);STRING$
     (27,"*")
1040 A$=GET$
1050 COLOUR3
1060 END
1070 DEFPROCOFF
1080 VDU23,1,1;0;0;0;
1090 ENDPROC
```



***Open Forum* is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £6 for each program published.**

## Maze 'n' Chase

### on Spectrum

Maze 'n' Chase is an addictive maze chase type program with a difference. You are the small man beginning at the bottom of the screen. You must move around the maze eating the dots and scoring points (use cursor control keys to move, arrows show direction of movement). However you must avoid the small invader that inhabits the maze, who moves towards you with deadly intent. Every spade you run into enables you to dig one hole in the maze (press key 0 to dig). Only the invader can fall down the holes you dig, and when he does you must race to the scene and fill in the hole (press key P to fill); this must be done before the invader has time to climb out.

Whenever an invader is buried, you will have several seconds before a new and identical invader appears. There are four spades in each maze. When you have cleared the maze of dots and spades, you will move on to a new and different maze. You have four lives. You score one point for each dot eaten, 10 points each spade picked up and 30 points for each invader buried.

#### Program notes

The program uses the Attr and Screen$ function extensively throughout to detect what is where in the maze. The main purpose of lines 104-240 is to control the movement of the invader. The invader will keep within the maze walls and will actually chase you. If the invader gets near you he will accelerate. User-defined graphics are used and are set up in lines 1000-1020. The maze is constructed in lines 5-50.

PROGRAM OF THE WEEK

```
   1 REM A-MAZE- N' CHASE
        by J.Southgate.
   2 GO SUB 1000
   3 LET h=0  LET li=4  LET sc=0
 LET y=0  LET p=0  LET o=1
   5 FOR i=1 TO 19 STEP 2  BEEP
.01,60-i*2  PRINT AT i,0, INK 0,
"................................
" NEXT i
  10 FOR n=2 TO 19 STEP 2  PRINT
 AT n,0, INK 6, [redacted]
  20 PRINT AT n RND*2...        IF
 RND>.2 THEN GO TO 20
  30 NEXT n
  35 PRINT AT 1,2, INK 4,"I",AT
5,26, INK 4,"I",AT 15,2, INK 4,"
I",AT 19,28, INK 4,"I"
  40 FOR n=0 TO 20  PRINT AT n,0
, INK 6,"■",AT n,30, INK 6,"■"
NEXT n
  50 FOR n=0 TO 30  PRINT AT 0,n
, INK 6,"■",AT 20,n, INK 6,"■"
NEXT n
  60 LET w=0  LET y=0  LET o=1
LET l=19  LET c=12  LET a=2  LET
 b=5
  65 PRINT AT l,c, INK 1,"A"  IF
 INKEY$="" THEN GO TO 65
  70 PRINT AT 21,2,"SCORE=",sc,A
T 21,14,"LIVES=",li,AT 21,25,"I=
",p  NEXT n
  71 PRINT AT l,c," "
  72 IF INKEY$="0" THEN GO SUB 5
00
  75 LET e$=INKEY$  IF e$>"4" AN
D e$<"9" THEN LET m$=e$
  80 LET l=l+(m$="6" AND ATTR (l
+1,c)<>62)-(m$="7" AND ATTR (l
-1,c)<>62)
  90 LET c=c+(m$="8" AND ATTR
(l,c+1)<>62)-(m$="5" AND ATTR (l
,c-1)<>62)
  92 IF ATTR (l,c)=60 THEN LET s
c=sc+10  LET p=p+1  LET w=w+1  B
EEP .5,20  IF w>=207 THEN LET sc
=sc+50  FOR n=0 TO 20  PRINT AT
n,0,"
",  BEEP .1,n*2. NEXT n  GO
TO 5
  95 IF SCREEN$ (l,c)="." THEN L
ET sc=sc+1  LET w=w+1  BEEP .001
,30  IF w =207 THEN LET sc=sc+50
  FOR n=0 TO 20  PRINT AT n,0,"

 BEEP .1,n*2  NEXT n  GO TO 5
 100 PRINT AT l,c, INK 1,"A"
 102 IF y=1 AND l=a AND (c=b-1 O
R c=b+1) AND INKEY$="p" THEN BEE
P .01,20  PRINT AT a+1,b, INK 6,
"■"  BEEP .5,20  BEEP .5,-20  LE
T sc=sc+30  LET a=1  LET b=5
 104 IF h=1 THEN PRINT AT a,b ".
 LET h=0  GO TO 100
 106 PRINT AT a,b," "
 108 IF y=1 THEN BEEP .01,-20  L
ET x=x+1  IF x=30 THEN LET y=0
PRINT AT a+1,b, INK 6,"■"
 109 IF y=1 THEN GO TO 70
 110 IF a=l THEN GO TO 200
 120 LET a=a+(a<l AND (ATTR (a+1
,b)<>62))-(a>l AND (ATTR (a-1,b)
<>62))
 125 IF o=1 AND ATTR (a,b+1)<>62
 THEN LET b=b+1
 128 IF o=-1 AND ATTR (a,b-1)<>6
2 THEN LET b=b-1
 129 IF ATTR (a,b+o)=62 THEN LET
 o=o*-1
 130 IF ATTR (a,b+o)=60 THEN LET
 o=o*-1
 135 IF SCREEN$ (a,b)="." THEN L
ET h=1
 140 PRINT AT a,b, INK 2,"Ω"  GO
 TO 70
 210 IF b>c THEN LET b=b-1
 220 IF b<c THEN LET b=b+1
 225 IF ATTR (a,b)=57 THEN FOR i
=65 TO 90  PRINT AT a,b CHR$ i
BEEP .01,i-40  NEXT i  PRINT AT
a,b,"A"  BEEP .5,-30  PRINT AT a
,b,"  LET li=li-1  LET l=19  L
ET c=5  LET a=1. LET b=5  IF li=
0 THEN GO TO 700
 226 IF ATTR (a+1,b)=59 THEN GO
SUB 600
 229 IF SCREEN$ (a,b)="." THEN L
ET h=1
 230 PRINT AT a,b, INK 2,"Ω"
 240 GO TO 70
 500 IF p=0 OR ATTR (l+1,c)<>62
OR m$="6" THEN RETURN
 510 PRINT AT l+1,c, INK 3,"■"
BEEP .1,-30  BEEP .1,-20  BEEP .
1,-10  LET p=p-1  RETURN
 600 LET y=1  LET x=1  BEEP .01,
20  PRINT AT a+1,b,"■"  ...-1,C
HR$ 8,"Ω"  BEEP .2,-10  BEEP .01
,80  GO TO 70
 700 PRINT AT 8,10, INK 2, INK 2
, PAPER 6,"GAME OVER"  BEEP 1,30
  INPUT , INK 7, PAPER 0,"PRESS
 ENTER TO PLAY AGAIN",u$  RUN
1000 FOR u=144 TO 146  FOR n=0 T
O 7
1010 READ r  POKE USR CHR$ u+n,r
  NEXT n  NEXT u
1020 DATA 24,36,66,165,66,36,90,
129,60,36,24,126,153,36,36,102,1
26,16,16,16,16,124,124,56
1030 RETURN
```

**Maze 'n' Chase**
*by James Southgate*

## Music

### on BBC

This machine code routine makes keying in programs more pleasant giving you a beep of varying pitch each time you press a key

The *Osrdch* vector is altered to point to this routine. At the end of the routine a jump is made to &DFA5 which is the normal contents of the vector at &210

The pitch of the note is determined by multiplying the ASCII code of the letter you press by three. An *Osword* routine is used to make the sound

Instructions on how to change the various parameters of the sound are given in the program. Lines 310 340 determine whether the code is less than 32 ie a control code. If it is a control code then a sound is not emitted. Lines 460 500 are responsible for making the sound

```
 90 *KEY10 OLD|M?&210=0 ?&211=&0D|M
100 ?&210=0 ?&211=&0D ?&70=2 ?&71=0
    ?&72=&F6 ?&73=&FF ?&74=0:?&75=0
    ?&76=4:?&7 7=0
110
120 REM ***** TO CHANGE THE
    AMPLITUDE OF THE SOUND USE
    '?&72=amplitude' *****
140 REM ***** TO SWITCH SOUND OFF
    USE NARD 0REAK OR ?&210=&A5
    ?&211=&DF ****
160 REM ***** TO CHANGE SOUND
    CHANNEL USE '?&70=channel*****
100 REM ***** TO CHANGE THE
    DURATION OF THE SOUND USE ?&76=
    duration. (TWENTIETHS OF A
    SECDND) *****
220 FOR PASS=0 TO 3 6TEP 3
230 P%=&D00
240 [OPT PASS
250 STA &00
260 PHA
270 TYA
200 PHA
290 TXA
300 PHA
310 LDA &00
320 SEC
330 SBC #31
340 BCS GTEQUAL
350 PLA
360 TAX
370 PLA
380 TAY
390 PLA
400 JMP &DFA5
410 .GTEQUAL
420 STA &01
430 ASL A
440 CLC
450 ADC &01
460 STA &74
470 LDA #7
480 LDX #&70
490 LDY #0
500 JSR &FFF1
510 PLA
520 TAX
530 PLA
540 TAY
550 PLA
560 JMP &DFA5
570 ]
580 HEXT
```

**Music**
*by Robert Turner*

## Wordgame

### on Dragon 32

The program produces a trackword-type game with a set time-limit

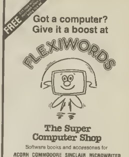
**Program notes**

| | |
|---|---|
| 10 | Initialise arrays etc |
| 20 50 | Select or reject instructions |
| 60 90 | Select own word |
| 100 120 | Select word from array |
| 130 170 | Scramble word |
| 180-250 | Prepare board |
| 260-330 | Run re run game |
| 340-380 | Prepared words |
| 390-480 | Print instructions |
| 500 | Accept user's word |

```
10 [illegible]
20 [illegible] PRINT [illegible] INSTRUCTION [illegible]
30 A$=INKEY$
40 IF A$="" THEN [illegible]
50 IF A$ [illegible] THEN [illegible]
60 [illegible]
70 PRINT [illegible] NINE-LETTER WORD [illegible]
80 A$=INKEY$:IF A$="" THEN 80
90 IF A$="N" THEN [illegible]
100 FOR N=1 TO [illegible] READW$(N):NEXT
110 [illegible]
120 FOR N=1 TO [illegible] NEXT
130 FOR N=1 TO [illegible] NEXT
140 FOR N=1 TO [illegible]
150 [illegible]
160 IF [illegible] THEN [illegible] ELSE 150
170 NEXT N
180 CLS
190 FOR [illegible] 100 TO [illegible] STEP [illegible]
```

```
200 PRINT@ E$
210 NE T
220 PRINT@ ,E$(1) PRINT@205,E$(2) PRINT@207,E$(3)
  0 PRINT@ ,E$(4) PRIN @ ,E$(5) PRINT@ 71 E$(6)
240 PRINT@ 1 E$( ) PRINT@ E$( ) PRINT@315,E$(9)
 50 PRINT@410 "
  0 TIMER=0
  0 IF TIMER  1 0 THEN 0
280 GOSUB 1000 10
 0 PRINT@ 1  YOUR TIME I  UF  HP$(2 3)
 0 PRINT@4 ' ANOTHER GAME  )'
 0 A$=INKEY$ IF A$='' THEN 10
 0 IF A$  THEN END
 0 RE TORE GOTO 0
 0 DATA AUBERGINE,ACCORDION,MELODRAMA,ARTICHOKE TRIBUTARY,BAC WATER
   AFFETI EF HIPOLATH LOLLIPOPS,BLACKJACK
50 DATA FRIMATEER NORWEGIAN SOVEREIGN AFTERWARD SEPTEMBER,PIECEMEAL
   IF TERCH, ANIHOVIE  BRIMSTONE TARANTULA
 0 DATA BUTTERCUP DANDELION SHIPMENT EPISCOPAL CATHEDRAL MANGANE E
   THROULATE,EPIDERMIS HEARTBURN ADRENALIN
 0 END
 0 CLS
390 PRINT'THE IDEA OF THE GAME IS TO"
400 PRINT'FORM WORDS BY COMBINING ADJACENTLETTERS.
410 PRINT"LETTERS CAN BE ADJACENT'
420 PRINT'HORIZONTALLY VERTICALLY. '
430 PRINT"OR DIAGONALLY.'
440 PRINT'EACH LETTER CAN BE USED ONLY'
450 PRINT'ONCE IN EACH WORD'
460 PRINT PRINT PRINT
470 PRINT'PRESS ANY KEY TO CONTINUE'
480 A$=INKEY$ IF A$="" THEN 480
490 RETURN
500 PRINT'WHAT S YOUR WORD'
510 INPUTWO$
520 IF LEN WO$  9 THENPRINT PRINT"NINE LETTERS PLEASE!" FOR  = 1 T
    1000 NEXT T GOTO500
530 FOR N= 1 TO 9 W$(N)=MID$(WO$,N,1) NEXT N
540 RETURN
```

**Wordgame**
*by D Lee*



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## Letter Puzzle

on Vic20

This program draws a five by five grid with the letters a to x. You then move the letters and try to get them into order. The instructions tell you the order in detail. You move the letters with the keys

W Up
A Left
D Right
X Down

— or use a joystick. The puzzle is like *Magic Squares* which are small plastic squares in which you move bits around to make words or pictures. The Rem statements are self explanatory and so you should be able to follow how the program works easily.

```
10 POKE 36879,8
12 POKE 36878,15
13 POKE 36864,12
20 REM
22 REM #### INITIALISE ####
25 REM
27 DIM P(30),C(30),T(24)
30 FOR I=1 TO 25
33 READ P(I) NEXT
50 REM #### DATA FOR POSITIONS ####
55 REM
60 DATA 7774,7777,7780,7783,7786
62 DATA 7840,7843,7846,7849,7852
64 DATA 7906,7909,7912,7915,7918
66 DATA 7972,7975,7978,7981,7984
68 DATA 8038,8041,8044,8047,8050
70 REM ## PUT CHARS IN RANDOM ##
71 C(25)=32
72 FOR I=1 TO 24
75 X=INT(RND(1)*24)+1
77 IF T(X)<>0 THEN 75
80 C(I)=X T(X)=1 NEXT I
100 REM
102 REM #### INSTRUCTIONS ####
105 REM
110 PRINT"     LETTER PUZZLE"
115 PRINT"    ________________"
120 PRINT"MOVE THE LETTERS AND  PUT THEM INTO ORDER"
125 PRINT"USE THE KEYS -"
130 PRINT"        W"
132 PRINT"        |"
134 PRINT"      A-S-D"
135 PRINT"        |"
138 PRINT"        X"
140 PRINT" OR USE THE JOYSTICK"
150 PRINT"     PRESS ANY KEY    "
155 GETA$ IFA$=""THEN155
160 PRINT"    LETTER PUZZLE"
162 PRINT"    ________________"
170 GOSUB 500 REM # GRID #
175 FOR I=1 TO 24
180 POKE P(I),I NEXT
185 PRINT"GET THE LETTER INTO   THIS ORDER."
190 PRINT"    PRESS ANY KEY    "
195 GETA$ IFA$=""THEN195
200 REM
202 REM #### SET UP PUZZLE ####
205 REM
210 PRINT"      LETTER PUZZLE"
215 PRINT"     ________________"
220 GOSUB 500 REM # GRID #
230 FOR I=1 TO 25
235 POKE P(I),C(I)
237 POKE P(I)+30720,4
240 NEXT I
250 TI$="000000"
260 P=25 TR=0
300 REM
303 REM #### PLAY ####
305 REM
307 POKE 36844,8
312 REM ## JOY STICK ##
313 M=0
314 J=PEEK(37137)
316 IF J=118 THEN M=-1
318 IF J=122 THEN M=-5
320 IF J=110 THEN M=5
322 POKE 37154,127
324 IF PEEK(37152)=119 THEN M=1
330 POKE 37154,255
332 REM ## KEYBOARD ##
333 REM-LARGE PETE-
334 J=PEEK(197)
336 IF J=09 THEN M=-5
338 IF J=17 THEN M=-1
340 IF J=18 THEN M=1
342 IF J=25 THEN M=5
352 IF M=0 THEN 300
355 P1=P+M
357 IF P1<26 AND P1>0 THEN 360
358 POKE36875,230
359 FORR=1TO400 NEXT:POKE36875,0 GOTO 390
360 IF M=1 AND P/5=INT(P/5)THEN 365
361 IF M=-1 AND P/5-.2=INT(P/5)THEN 365
362 IF M=-1 AND P=21 THEN 365
363 GOTO 370
365 POKE 36875,220
366 FORR=1TO400 NEXT
367 POKE 36875,0 GOTO300
370 POKE P(P),PEEK(P(P1))
372 POKE P(P),PEEK(P(P1))
375 POKE P(P1),32
376 POKE 36876,200
377 FORR=1TO200 NEXT
378 POKE36876,0
379 P=P1 TR=TR+1
380 REM
382 REM #### CHECK FOR WIN ####
383 REM
384 FOR I=1 TO 24
385 IF PEEK(P(I))<>ITHEN 390
387 NEXT GOTO 700
390 PRINT"                    TIME ",TI$
395 PRINT" MOVES ",TR
400 GOTO 300
500 REM
502 REM #### DRAW GRID ####
505 REM
510 PRINT"      ┌──┬──┬──┬──┬──┐"
520 FOR I=1 TO 4
530 PRINT"      │  │  │  │  │  │"
535 PRINT"      │  │  │  │  │  │"
540 PRINT"      ├──┼──┼──┼──┼──┤"
545 NEXT I
550 PRINT"      │  │  │  │  │  │"
555 PRINT"      └──┴──┴──┴──┴──┘"
560 RETURN
700 REM
702 REM #### WIN ####
703 REM
705 PRINT"      WELL DONE YOU MADE IT!"
710 FOR I=1 TO 10
720 POKE 36875,0 POKE36876,120
730 FORR=1TO300 NEXT
740 POKE 36875,0 POKE36875,120
750 FORR=1TO300 NEXT
760 NEXT I
765 POKE 36875,0
770 PRINT"   ANOTHER GO(Y OR N)"
780 GETA$ IFA$=""THEN780
790 IFA$="Y"THEN RUN
800 PRINT"" POKE36879,27
810 POKE 36864,12
```

**Letter Puzzle**
*by A Blackham*

## Input

### on Spectrum

The purpose of this piece is to provide an alternative to using the *Input* statement when entering numerical data into Spectrum. The *Input* statement has three major faults: first the value entered is removed from the screen once the *Enter* key has been hit. The second is that using *Input* stops you from using the bottom two lines of the screen for display purposes. Third and most importantly *Input* is not user friendly for numeric data: if we hit a non numeric key by accident (and we all do this from time to time), then the program will crash with an error code 2.

Program 1, which uses *Inkey$* instead of *Input* has been written as a subroutine which can be used with other programs. An input prompt is printed (line 3010) and the auto repeat is cancelled (line 3020). The subroutine now waits for a key to be hit and the result is stored in location B$. Lines 3050 to 3100 test the *Code* of the last key hit to ascertain whether or not that key is valid for numeric data.

Program 2 is an illustration of a main program using this subroutine, the data that we enter being stored in an array X. As the subroutine stores the numeric data as a string, we must use the *Val* function if we wish to use X as our array.

Also it is convenient to initiate an auto scroll (lines 60 and 160) in case we wish to store more than 20 numbers. The *Print* statement following the *Gosubs* are necessary because the subroutine does not force the computer to move to the next line. Program 3 illustrates how the subroutine can be used when entering pairs of numbers — in a regression program for example. I have found this subroutine to be especially useful when I have written programs where the output is in the form of a table, but one entry per line of the table is an input.

**Program 1**

```
3000 LET A$=   LET D=0
3010 PRINT FLASH 1, "", FLASH 0,
 CHR$ 8,
3020 IF INKEY$      THEN GO TO 30
20
3030 IF INKEY$=    THEN GO TO 303
0
3040 LET B$=INKEY$  LET Z=CODE B
$
3050 REM CHECK FOR VALID ENTRY
3060 IF Z>47 AND Z<58 THEN GO TO
 3130
3070 IF Z=13 AND A$<>   THEN GO
TO 3230
3080 IF Z=46 AND D=0 THEN GO TO
3120
3090 IF Z=12 THEN GO TO 3170
3100 GO TO 3020
3110 REM ENTRY ACCEPTED
3120 LET D=1
3130 LET A$=A$+B$
3140 PRINT B$,
3150 BEEP .1,16
3160 GO TO 3010
3170 REM DELETE LAST ENTRY
3180 IF A$=    THEN GO TO 3020
3190 IF A$(LEN A$)= .  THEN LET
D=0
3200 LET A$=A$(1 TO LEN A$-1)
3210 PRINT     ,CHR$ 8,CHR$ 8,
3220 GO TO 3010
3230 REM ENTER PRESSED
3240 IF A$= .  THEN GO TO 3020
3250 PRINT        BEEP .1 10
3260 RETURN
```

**Program 2**

```
 10 DATA  1st , 2nd , 3rd'
 20 PRINT 'HOW MANY ENTRIES? ,
 30 GO SUB 3000  LET N=VAL A$
 40 PRINT
 50 DIM X(N)
 60 PRINT
 70 POKE 23692,255
 80 FOR I=1 TO 3
 90 READ A$
100 PRINT A$,  NUMBER =  ,
110 GO SUB 3000  LET X(I)=VAL A
$
120 PRINT
130 NEXT I
140 FOR I=4 TO N
150 PRINT I, th NUMBER =
160 GO SUB 3000  LET X(I)=VAL A
$
170 PRINT
180 NEXT I
190 STOP
```

**Program 3**

```
 10 PRINT  HOW MANY PAIRS?  ,
 20 GO SUB 3000  LET N=VAL A$
 30 DIM X(N)  DIM Y(N)
 40 PRINT  PRINT
 50 PRINT TAB 5, X VALUE ,TAB 2
0, Y VALUE
 60 POKE 23692,255
 70 FOR I=1 TO N
 80 PRINT TAB 8,
 90 GO SUB 3000  LET X(I)=VAL A
$
100 PRINT TAB 23,
110 GO SUB 3000  LET Y(I)=VAL F
$
120 PRINT
130 NEXT I
140 STOP
```

**Input**
*by Ronald Jones*

## Beginners only

What would you recommend as a good Adventure for a beginner to start on? This is a question tha I am often asked and to be truthful I cannot answer it!

There are nowadays several categories of Adventure — we can distinguish text Adventures, text with graphics, and graphics-only Adventures We can further reduce any Adventure to one of two types if we concentrate on playing techniques.

Programs like *The Hobbit* or *Valhalla*, and most of the D&D type combat Adventures actually change with each playing and the solution to the game at one playing need not necessarily be the solution at the next playing Having silly Thorin wandering about wittering on about Gold or Mary bashing you over the head when you let loose a perfectly reasonable bit of strong language may prove a bit confusing to the beginner, who has enough to worry about (although I recently had a letter from an Adventurer of eight years old who completed *The Hobbit* in just a week or so!)

So although the unpredictable elements in this kind of Adventure may appeal to some players in general the beginner will find that text Adventurers are easier to play with graphic Adventures being tackled later

From America Scott Adams and his company Adventure International have one of the most well-known catalogues of Adventures These are available for all the American computers — Atari Vic20 CBM 64, Apple — and have the added bonus of a Difficulty Rating system Thus *Pirate Adventure* is the easiest and would be a good place for the absolute beginner to start The others range through Medium Difficulty to Advanced Adventurers Only Need Apply!

Probably the hardest is *Savage Island Part 2* and I wouldn't recommend this one to a complete novice Anyway, they're all pretty good value and if you have an Atari or Apple you can get to see a SAGA (Scott Adams Graphic Adventure) — they are rather expensive and apart from the pretty pictures are exactly the same as the text version

The Scott Adams Adventures are now available for the Spectrum Adventure International has finally woken up to the fact that there are a million Sinclair owners a large percentage of whom are just dying to get their hands on a Scott Adams Adventure — and none of them will be disappointed!

Of the other American text Adventures easily available over here I must single out for mention the Infocom series *Zork I, II* and *III* are the most famous but the others like *Suspended* in which the player controls six robots which are his eyes ears and other senses and *Witness* and *Deadline* which contain complete dossiers of Police files are equally as good They're all very expensive — but they are state-of the-art

All this is pretty advanced stuff however, and I only mention them as an example of what goodies you can look forward of

Back on solid ground and in the UK, we have many companies putting out Adventures which would make a good starting point for our budding Adventurer

For the ZX81 and Spectrum a good range of Adventures is available from Artic There are four of them, with a fifth in preparation With the exception I believe, of the latter they are all text (complete with the occasional odd spelling!) The scenarios and plots are excellent and invoke a good sense of atmosphere But be warned — although they are a good introduction, they are not easy and occasionally need rather lateral thinking (but that's what Adventuring is all about!)

Having been around for a number of years they have obviously stood the test of time — three years is an eternity in the home computing market!

A large range of computers is catered for by Channel 8 Adventures In the distant past they were writing for the Nascom and Tandy TRS80, but in the last few months, the company has written versions of its 12 Adventures (and this number may increase by two or three in the next few weeks) for a much larger range of machines, which includes the BBC Spectrum Commodore and Atari computers

The Adventures are text supported by nicely-drawn graphics and the pictures pretty though they are can be toggled on or off as the player wishes In fact they have to be cleared from the screen if the player wishes to see what is at the current location

They are all written by Brian Howarth who obviously takes Scott Adams as a model and his programs are a good training ground for the beginner

Other worthwhile additions to the Spectrum owner's library are the Phipps Associates Adventures Written by Mike Farley they are, again text Adventures supported by graphics Unfortunately these are very slowly drawn and the whole process can be very boring when repeated again and again However the Adventures themselves cannot be faulted and *Knight's Quest* has become something of a classic Spectrum Adventure

For the beginner *Greedy Gulch* contains many of the common problems to be found in Adventures and is a good beginner's program

The Spectrum of course is the machine with probably the biggest support from third-party software authors, and among their products are many good Adventures

For the Dragon Salamander has the Dan Diamond Trilogy A pastiche of the Mike Hammer sort of detective novel they follow the fortunes of the Private Eye from a graveyard in California in *Franklin's Tomb* to deep space in *Lost In Space*, to a watery alien world in *Fishy Business* These Adventures are text only although the beautifully produced accompanying manuals contain pictures of many of the locations with clues embedded in them

*Pettigrew's Diary*, from Shards Software is a graphic Adventure but suitable for beginners and certain to keep anyone hooked for many hours while travelling through the London Underground system among other locations

Acornsoft in their initial release of software for the BBC included a couple of Adventures *Castle Of Riddles* and *Philosopher's Quest* have been with us for a couple of years and still baffle people with dancing bears and rainbow-coloured rods Third-party software is now coming through for the BBC machines

For the Oric you will find some good Adventures among the Tansoft catalogue — *Zodiac Adventure* being one of the better programs for beginners

This list has been necessarily brief — In future weeks I'll look at some in more detail and add to the list ■

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly* 12-13 Little Newport Street London WC2R 3LD



## DOES IT EXIST?

*G Back of Bradbourne Road St Johns Sevenoaks Kent writes*

**Q** **Do you know anything about the *Rom* cartridge slot on the BBC micro? I know that it costs £55 to install and you get a speech chip but what about the cartridge for the slot? Do they exist? My dealer cannot help.**

**A** In short, no! Now that the Electron has at last seen the light of day the *Rom* cartridge slot remains the great mystery of Acorn Computing. As far as I know all you can get for the £55 is the speech chip with its 175 word vocabulary. Apart from that, to my knowledge there are no cartridges available from Acorn or anyone else.

Perhaps one of the reasons for this is that Acorn have released no specifications for the cartridge; the handbook that comes when the cartridge is added is, to say the least, sketchy. I doubt that cartridges will become available in the near future, especially as the Electron does not have the cartridge slot.

## DISC TO CARTRIDGE

*Dr Manfred Dechmann of Herrenbergstrasse 1 Zurich writes*

**Q** **How can I load programs on disc on to a cartridge or module? I need a few programs very often — five times a day — and so I want to save the loading time even from disc.**

**I have a C64 with 1541 disk station and Epsom RX80**

**A** If I understand your question correctly what you are asking is how to copy disc programs to cartridge. The answer I [illegible] is with great difficulty. Unlike copying from tape to disc where the problem can be solved by playing around with the software [illegible] functions etc, a cartridge [illegible] program [illegible] Eprom and mounted [illegible] cuit board.

In some magazines from America I have seen devices that enable you to burn in your own Eproms but they are very expensive. I doubt though that this would solve your problem. If you are using the disc information daily for something like word processing, the Eprom has two major problems: firstly it can't have programs longer than 16K, sometimes 16K is probably not enough for such purposes — and secondly you cannot change the data information as with a disc — adding and erasing addresses for example.

I'm afraid the only real way you have of speeding up access times is to see if your disc system cannot be improved in some way but I doubt any difference would be very substantial.

## ZX PRINTER

*G T Swain of Larmead Crescent Edgeware Middlesex writes*

**Q** **I own a Sinclair ZX81 and I have a Spectrum on order. Can you recommend a printer that could be used with either machine. I already have a Sinclair printer, and to say the least it is not very good.**

**A** Other than the Sinclair printer there are no printers that you can connect directly to your ZX81 or Spectrum (there is the plain paper version of the Sinclair printer available that was originally designed for use with the Times).

So any other printer you might choose will need to be interfaced. Almost all the available interfaces are Centronics ie they enable you to connect your Spectrum to Centronics printers — fortunately this is the vast majority. Suitable interfaces are made by Hilderbay, Kempston, Lismann and Micro's (among others) and with them you should find that virtually any cheap printer can be connected.

As to what you should buy it really is up to you. How much money do you want to spend? Is it mainly for letters or listings? If you don't want to spend more than £200 and only need it for listings then any dot matrix printer will do — an Epsom for example. If it's for important letters, then you may need a Daisywheel costing more like £350.

I doubt that any other than Spectrum interfaces will work with the ZX81 — you will probably have to buy a special one for it although you should be able to use the same printer.

## OVERHEATED VIC

*Matthew Smith of Elan Avenue, Stourport on-Severn writes*

**Q** **Not wishing to pay £200 plus for a Commodore printer, I was considering buying a smaller one. The one I have noticed is the Amber which is £70 but I would like to know if a dearer one would pay off?**

**The other problem that I have is overheating. After an hour my Vic gets very hot, and after about three hours it reduces my programs to gibberish. This means that I have to turn off and start again. I find that the slits at the back do little to help the problem. Is there a small cheap fan available that I could use to reduce the heat?**

**A** People are always asking questions about printers - quite rightly since they can cost more than the computer itself. There are all sorts of problems with buying printers but they are particularly highlighted with Commodore machines.

The problem is this — Commodore programs make much use of control characters — particularly for cursor movement and colours, consequently listings are full of them. Since you were considering the Amber I would guess that your main requirement from a printer is to do program listings rather than word processing. The problem is that the Amber, and indeed all printers other than the Commodore ones, do not support the control characters. Thus, even assuming you manage to interface a printer to your Commodore so that it will print basic numbers and letters, it will still not print the control characters. I think you would be best advised to look for a second hand Commodore printer — you should be able to find one for less than £200.

Your heat problem is very common and apart from taking care to save programs every couple of hours or so there isn't much you can do. Commercial computers have inbuilt coolers but it is hardly practical for you to open up your computer and put a fan in it.

## LYNX USER GROUP

*Ms G Marsh of Kingston Road Oxford writes*

**Q** **I have recently bought myself a 96k Lynx computer, and while I'm pleased with it I also find that there is very little published for it. I suppose that's what happens if you get a computer that is not a big seller. What I would actually like to know, is there a Lynx User group?**

**A** The Lynx as you rightly imply is overshadowed by the likes of the BBC at one end and the Spectrum at the other. It is a pity because it is fundamentally a good computer. However all is not lost as there is a Lynx User group, namely NILUG (National Independent Lynx User Group). The address you want is NILUG 53 Kingswood Avenue Sanderstead South Croydon Surrey CR2 9DO.

**Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, 12-13 Little Newport Street, London WC2R 3LD**

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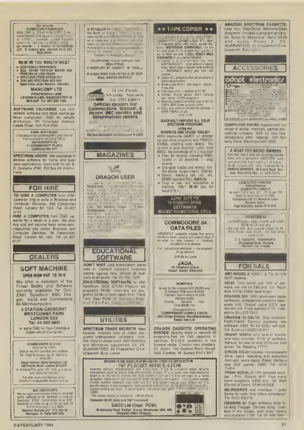
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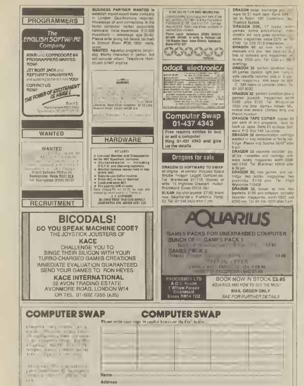
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**16K ZX81** [illegible] plus £200 worth [illegible] 15 cassettes and Ram pack [illegible] Basildon (0268) 25438

**£200 OF SOFTWARE (ZX81)** swap for Memotech keyboard or sell for £30 Wanted 48K Spectrum or 16K Spectrum (Mark II) Will pay extra for software Tel Southport (0704) 26728

**WANTED** Any adventure programs for ZX81 16K Phone Gregory 0349 862026

**AQUARIUM** computer to swap for any computer apart from ZX81 01-472 4192 after 4 pm

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**BBC B** 1.2 Rom [illegible] and magazines £30[illegible] 3788 after 6 pm

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**BBC 32K O.S. 1.2** for sale Perfect condition £270 Tel 0905 80840 weekends

**CRS8?** books manuals level one games pack and books Offers ZX microdrive order form Tel 021 742 1440 after 8 pm

**BBC B** plus two joysticks and £200 software and magazines boxed including all leads all for £380 Tel Glasgow 771 1793 after 7 pm

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## Wanted

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**MICRODRIVE ORDER FORM** [illegible] and software [illegible] swap etc Tel Jon 01 944 2653

**MICROKET PEN PAL WANTED** [illegible] ing micro [illegible] information of hardware software [illegible] general Spectrum news [illegible] message on account Tel [illegible] 8477

**ATARI CARTRIDGES** to swap [illegible] Kazy Shootout Assembler Editor Video Easel Swap Co[illegible] MT64 keyboard for Series 3 Spectrum Tel Jeremy 01 363 1578 after 6 pm or weekend

**SPECTRUM** and CBM 64 [illegible] software wanted for immediate [illegible] Offer must be makers originals [illegible] cassette [illegible] intact Prefer [illegible] collections in London area Details plus telephone 01 520 0404

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**ATARI VCS** in perfect condition [illegible] cartridges Missile Command Space Invaders Adventure Night Driver Street Racer Combat with extra paddles swap for 48K Spectrum Tel 01 784 7769 evenings around 5 pm

## SCALE DOWN

Although it's called *Logo art* this new program from Hobby Software has relatively little to do with the famous language used with Turtles and the like

In fact *Logo art* is an *Artists Designer*-type program, albeit one with a good many features

For the Dragon 32 it allows you to draw in any *Pmode* and *Save* your creation to tape Apart from the usual draw/erase line features there is a choice of scaling, ie how far the line moves for each instruction down to a single pixel point

**Program** *Logo art*
**Price** *£6 95*
**Micro** *Dragon 32*
**Supplier** *Hobby Software*
*8 Elgar Avenue*
*Chapel House Estate*
*Newcastle upon Tyne*
*NE5 1HZ*

## OPENING TIME

*Pi f yed* is the latest in Automata's growing range of arcade games for the Spectrum As ever it refrains from violence and concerns itself instead with the serious business of drinking — something dear to the PIman's heart (he must be a journalist)

The game is not likely to give Ultimate any sleepless nights at least not technically but it is good fun for all that

Using the cursor keys you move the Piman along a road full of traffic (a bit like *Frogger* — *Pigger* perhaps?) to evade the traffic he can enter one of the buildings that flash past — surprisingly most of these seem to be pubs

Once in a pub the Piman must drink all the pints on the table — this makes him drunk and difficult to control, consequently he falls over everyone this loses points

Other locations simply produce funny (fairly) messages and the aim of the game is really to last as long as you can

**Program** *Pi Eyed*
**Price** *£6*
**Micro** *Spectrum 48K*
**Supplier** *Automata*
*27 Highland Road*
*Portsmouth*
*Hants PO4 9DA*

## NOTATION

Vectors was one of those mathematical concepts that I never really mastered — maybe what I needed was *Vectors* by Salamander Software

This package is a collection of 14 programs which cover most of the vector algebra required for A level maths

Subjects include Scalar multiplication matrix notation modulus ratio theorum and many others

The 14 programs develop logically on from one another and were written by a senior lecturer in mathematics

The programs can be saved to disc should you have one and will work on both the BBC B and the Electron

**Program** *Vectors*
**Price** *£24 95*
**Micro** *BBC B Electron*
**Supplier** *Salamander*
*17 Norfolk Road*
*Brighton*
*East Sussex*
*BN1 3AA*

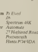
## WIDE-EYED

Astronomy fans should get hours of wide-eyed entertainment from *The Cosmos* by Eclipse Software

This program attempts to display the entire Cosmos on your 48K Spectrum from next door neighbours like the Virgo Cluster — a mere 2 000 light years away to remote regions like the Hydra Cluster

**Program** *The Cosmos*
**Price** *£5 95*
**Micro** *Spectrum 48K*
**Supplier** *Eclipse Software*
*79 Ardrossan Gdns*
*Worcester Park*
*Surrey KT4 7AX*

## AROUND SPACE




The galaxy is your playground in *Megawarz* a magical planetary trip which takes you from Pluto to Mars battling it out with various aliens whose degree of vulnerability to your firepower is illustrated by their colour which changes periodically

Your ship comes equipped with shields which have to be replenished from time to time by capturing astronauts who for some reason are hurtling through space towards you

Movement is either by joystick or the keyboard and you can select the difficulty level and adapt the game to make it more or less difficult

The first round ends when you have destroyed aliens in every corner of the galaxy and arrived back at the earth and then — guess what? It all starts again faster and meaner

**Program** *Megawarz*
**Price** *£7 50*
**Micro** *Commodore 64*
**Supplier** *Paramount Software*
*67 Bishopton Lane*
*Stockton on Tees*
*TS18 1PT*

## TIME LORDS

If unbelievably difficult text adventures appeal to you then you are bound to react with glee to the news that Level 9 has just issued its latest epic *Lords of Time*

Nine evil timelords are out to cause chaos throughout human history Using a mystic time's clock you must travel through nine different periods of time looking for the nine special objects which together will save eternity

The adventure is being issued for seven different machines and is entirely in machine code Responses are fast and even more important Level 9 have thought about a suitable response for when you haven't typed in the right thing other than I don't understand Another winner

**Program** *Lords of Time*
**Price** *£9 90*
**Micro** *Most (32K +)*
**Supplier** *Level 9 Computing*
*229 Hughenden Road*
*High Wycombe*
*Bucks HP13 5PG*

## BLOCKED MAZE

*Skull* is a machine code maze game for the Spectrum 48K The only object of the game is to stay alive as long as possible and accumulate as many points as possible This is achieved by finding various treasures that are scattered throughout the maze

Problems take the form of nasty skulls that will defend the treasure You may also find that your way through the maze is suddenly blocked by a portcullis that can only be raised by a special key

The 3-D views through the maze are very well done — in a similar way to *Transylvanian Tower* by Richard Shepherd — and also like that game you can elect to view a map of what's located where but you

need to have a good memory as it dissolves within a couple of seconds. Very enjoyable with lots of tactical play possible.

**Program** *Skull*
**Price** *£6.95*
**Micro** *Spectrum 48K*
**Supplier** *Games Machine, Bessemer Drive, Stevenage, Herts SG1 2DX*

## SINGLE PIXEL

A very nice idea this. *Datald* is a Dragon graphics program that comes not only with a manual but also a specially designed protractor and ruler.

The program itself is a fairly standard drawing program with fill and a choice of movement detail — from single pixel to 20 pixels. But the ruler and protractor look really useful in enabling accurate plotting on the high resolution screen.

The whole package is neatly put together and anything you create can be *Saved* for use in your programs. The price is reasonable too.

**Program** *Datald*
**Price** *£10.95 (+£1.00)*
**Micro** *Dragon 32*
**Supplier** *Detail Utility Products, 32 Slepe Crescent, Brooklands Park, Branksome, Poole, Dorset BH12 4DN*

## EIGHT WAVES

More arcade action for the Oric 48K. *Starship* from Sector 7 Software would seem to have all the necessary requirements for the genre — eight waves of different aliens, machine code etc.

On this particular game you are required to defend earth (armed only with three gigantic battlecruisers) from a massed onslaught by the war fleet of the Cirellian Empire.

Apart from high score tables the game has an added feature not often seen on Oric games — it loads a pretty title screen for you to look at, whilst the Oric is taking its usual interminable time to load.

**Program** *Starship*
**Price** *£6.50*
**Micro** *Oric 1 48K*
**Supplier** *Sector 7 Software, PO Box 8, Newton Abbot, Devon TQ12 1UE*

## MORTGAGE

*Vic Money Manager* is one of Ivan Berg Software's growing range of utility packages for the Vic20 plus 8 or 16K.

The box contains two cassettes and a manual. The main program is *Money Manager* which is a fairly straightforward accounts program allowing you to keep records of bank statements, tax demands etc., recording the main details with the relevant dates.

There are facilities to get a balance of your account and to credit regular income payments. You may also list standing orders and compare actual and estimated expenditures.

The second tape is *Money Calculator* which contains programs for mortgage and interest calculation.

**Program** *Vic Money Manager*
**Price** *£9.99*
**Micro** *Vic20 (8K 16K)*
**Supplier** *Commodore, 675 Ajax Avenue, Slough Trading Estate, Slough, Berks SL1 4BG*

## ENERGY LEVEL

*Krago Castle* is an adventure game with strategy overtones. Although a lot of the time you concern yourself with secret passages and locked doors whilst wondering what effect drinking the mysterious potion is going to have, you also have to maintain your energy for frequent bouts of combat with nasty monsters.

Although there are a couple of nice title screens, most of the action is text only — mainly Basic with machine code subroutines — a quick play suggested there were quite a few clever ideas in the game.

**Program** *Krago Castle*
**Price** *£6.00*
**Micro** *Spectrum 48K*
**Supplier** *Assassin Software, 10 Ash Road, Leeds 6*

## GRAPHICS AID

Print n Plotter originally produced a range of practical aids for Spectrum program development in the form of large sheets of lined paper which mimicked the layout of the pixels on the Spectrum screen.

It has now issued a program that looks just as useful. *Paintbox* is basically a very sophisticated designed program. The potentially very impressive results are illustrated in both the adds and the helpful manual that comes with it.

The advantage of *Paintbox* is that like other similar programs it allows you etch a sketch' like facilities but it also gives you up to 84 user defined graphics with each design especially useful for interesting type faces. If you've been looking for a Spectrum graphics aid, this seems like one of the best.

**Program** *Paintbox*
**Price** *£7.50 (p+p 75p)*
**Micro** *Spectrum 48K*
**Supplier** *Print n Plotter Products, 19 Borough High Street, London SE1 9SE*

## SUN TRAP

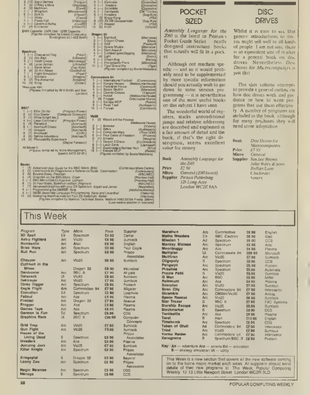
*Here Comes the Sun* is a graphics adventure from Alligata Software who have previously concentrated on BBC, Commodore and Dragon programs — this one is for the Spectrum.

The general plot sounds a little like Artic's *Ship of Doom* — you have to find your way to the retro rockets of a ship and activate them before you are dragged into the sun.

The program is supposed to be extremely difficult and will allow inputs other than *Take X* or *Drop Y* like *The Hobbit*.

Although hi-res, the graphics are fairly simple, but sound is used to good effect — one the hardened text adventurer will enjoy.

**Program** *Here Comes the Sun*
**Price** *£7.95*
**Micro** *Spectrum 48K*
**Supplier** *Alligata Software, 178 West Street, Sheffield S1 4FT*



## Top 10

**Atari**

1 (7) Zaxxon (Datasoft)
2 (10) Bay's Demise (Penguin)
3 (8) O'Riley's Mine (Datasoft)
4 (8) Meltdown (Ceom)
5 (—) Wingman (Micropross)§
6 (—) Zork III (Infocom)
7 (—) Slinky (Cosmi)
8 (—) Planet Fall (Infocom)‡
9 (—) Cavern of Kafka (Cosmi)†
10 (4) Enchanter (Infocom)†

§48K Cassette ‡32K Disk †32K Cassette
(Figures compiled by Calisto Computers Birmingham 021-632 Book)

**Spectrum**

1 (—) Chequered Flag (Psion)
2 (1) Atic Atak (Ultimate)
3 (—) Death Chase (Micromega)
4 (8) Lunar Jetman (Ultimate)*
5 (—) Manic Miner (Bug-Byte)
6 (8) 3D Ant Attack (Quicksilva)
7 (—) Flight Simulation (Psion)*
8 (—) Stonkers (Imagine)
9 (7) The Alchemist (Imagine)
10 (4) Kong (Ocean)

*Requires 48K
(Figures compiled by W H Smith and Son London)

**BBC***

1 (—) Killer Gorilla (Program Power)
2 (2) Disc Doctor (Computer Concepts)
3 (1) White Knight Mk 2 (BBC)
4 (—) Laser Command (Program Power)
5 (3) Planetoid (Acornsoft)
6 (—) Acornsoft Chess (Acornsoft)
7 (5) Snapper (Acornsoft)
8 (7) Wordspell (Orlbit)
9 (6) Sphinx Adventure (Acornsoft)
10 (9) Phosability Experiment (Digital Fantasia)

All Model B
(Figures compiled by Micro Management, Ipswich 0473 59181)

**ZX81**

1 (—) Asteroids (Quicksilva)
2 (—) Defender (Quicksilva)
3 (—) Invaders (Quicksilva)
4 (—) Scramble (Quicksilva)
5 (—) Centipede (DK Tronics)
6 (—) Invaders (Bug-Byte)
7 (3) Krazy Kong (PSS)
8 (10) ZX DB Disassembler (Bug-Byte)
9 (7) Hopper (PSS)
10 (6) Froth (Sinclair)

**Dragon 32**

1 (—) Eightball (Microdeal)
2 (—) Dragon Chess (Oasis)
3 (—) SAS (Peaksoft)
4 (—) Space Shuttle (Microdeal)
5 (—) Dent Assault (Microdeal)
6 (—) Cuthbert goes Digging (Microdeal)
7 (4) Ugh! (Softek)
8 (—) Dream Bug (Kenelg)
9 (—) Intergalactic Force (Microdeal)
10 (—) Tiger Grand Prix (Tiger)

(Figures compiled by Boots/Websters)

**Commodore 64**

1 (—) International Football (Commodore)
2 (—) Hungry Horace (Melbourne House)
3 (—) Forbidden Forest (Centresoft)
4 (—) Space Shuttle (Microdeal)
5 (—) Cosmic Convoy (Taskset)
6 (—) Hobbit (Melbourne House)
7 (8) Frogger (Interceptor Micros)
8 (—) Escape MCP (Rabbit)
9 (—) Road Toad (Audiogenic)
10 (—) Falcyan (Centresoft)

**Vic20**

1 (3) Wizard and the Princess (Melbourne House)
2 (—) Snooker (Visions)
3 (—) Attack (Audiogenic)
4 (—) Computer Wars (Thorn EMI)
5 (—) Four Gates of Freedom (Phoenix)
6 (1) Arcadia (Imagine)
7 (—) Sargon II Chess (Commodore)
8 (—) Laser Zone (Llamasoft)
9 (—) Supervaders/Bomber Run (KTel)
10 (—) Escape MCP (Rabbit)

(Figures compiled by Boots/Websters)

**Books**

1 (4) Advanced User Guide for the BBC Micro *Bray* (Cambridge Micro Centre)
2 (5) Commodore 64 Programmer's Reference Guide *Commodore* (Commodore)
3 (6) Beyond Basic, *Freeman* (BBC/NEC)
4 (5) Graphics on the BBC Micro *Cryer* (Prentice-Hall)
5 (—) BBC Micro Disk Companion *Latham* (Prentice-Hall)
6 (1) 30 Hour Basic, Spectrum edition *Prigmore* (BBC/NEC)
7 (7) Advanced Graphics with your ZX Spectrum *Angell and Jones* (Macmillan)
8 (—) Programming the M6809 *King* (Addison-Wesley)
9 (—) 6809 Assembly Language Programming *Kane and Leventhal* (Osborne)
10 (8) Mastering Machine-code on Your ZX Spectrum *Baker* (Interface)

(Figures compiled by Watford Technical Books Watford 0923 23324 Prestel 28844)
(Last weeks position in brackets)

## Book Ends

### POCKET SIZED

*Assembly Language for the Z80* is the latest in Pitman's Pocket Guide Series neatly designed instruction books that actually will fit in a pocket

Although not machine specific — and so it would probably need to be supplemented by more specific information should you actually wish to get down to some serious programming — it is nevertheless one of the most useful books on this subject I have seen

The wonderful world of registers, stacks unconditional jumps and relative addressing are described and explained in a fair amount of detail and the book, if that's the right description, seems excellent value for money

**Book** *Assembly Language for the Z80*
**Price** *£2 50*
**Micro** *General (Z80 based)*
**Supplier** *Pitman Publishing 128 Long Acre London WC2E 9AN*

### DISC DRIVES

Whilst it is easy to see that general introductions to micros might sell well to all kinds of people I am not sure there is an equivalent size of market for a general book on disc drives Nevertheless *Disc Drives for Microcomputers* is just that

This slim volume attempts to provide a general outline on how disc drives work and guidance on how to write programs that use them effectively A number of programs are included in the book although for many machines they will need some adaptation

**Book** *Disc Drives for Microcomputers*
**Price** *£7 95*
**Micro** *General*
**Supplier** *Sinclair Brown John Wiley & Sons Baffins Lane Chichester Sussex*

## This Week

| Program | Type | Micro | Price | Supplier |
|---|---|---|---|---|
| 3D Spell | Ed | Spectrum | £6 95 | Camel |
| Astro Fighters | Arc | Vic20 | £6 95 | Sumlock |
| Bembastic | Arc | Atari | £6 95 | English |
| Brick Wars | Arc | Spectrum | £3 95 | Paul Coyle |
| Bull Run | Arc | Spectrum | £5 95 | Phipps Associates |
| Chopper | Arc | Vic20 | £5 95 | Sumlock |
| Cuthbert in the Mines | | Dragon 32 | £8 00 | Microdeal |
| Dambuster | Arc | BBC B | £7 95 | Allgate |
| Datapack | Ut | Vic20 | £6 95 | Sumlock |
| Dektroyer | Arc | Vic20 | £7 95 | Sumlock |
| Dinky Digger | Arc | Spectrum | £6 95 | Postern |
| Eagle Flight | Arc | Commodore 64 | £7 95 | Alligator |
| Execution | Ed | Spectrum | £3 95 | Loophole |
| Fallout | Arc | Ace | £4 95 | Plasma |
| Fireball | Arc | Dragon 32 | £7 95 | Abacus |
| Frogger | Arc | Ace | £4 95 | Plasma |
| Games Tape | Arc | Ace | £4.95 | Plasma |
| German is Fun | Ed | Spectrum | £5.95 | CDS |
| Graphics Rom | Ut | BBC B | £29 00 | Computer Concepts |
| Grid Trap | Arc | Vic20 | £7 95 | Sumlock |
| Gun Fight | Arc | Vic20 | £6.95 | Sumlock |
| House of the Living Dead | S | Spectrum | £5 95 | Phipps Associates |
| Invaders | Arc | Ace | £4 95 | Plasma |
| Jumping Jack | Arc | Vic20 | £7 95 | Sumlock |
| Killer Knight | Arc | Spectrum | £5 95 | Phipps Associates |
| Kriegspiel | S | Dragon 32 | £6 95 | Beyond |
| Loony Zoo | Arc | Spectrum | £5 95 | Phipps Associates |
| Magic Meanies | Arc | Spectrum | £5 95 | CDS |
| Manage | S | Spectrum | £6 00 | CCS |
| Marathon | Arc | Commodore | £6 95 | English |
| Maths Invaders | Ed | BBC Electron | £6 95 | Stell |
| Mission 1 | Ad | Spectrum | £6 00 | CCS |
| Monkey Bizness | Arc | Spectrum | £5 95 | Artic |
| Moonbuggy | Arc | Ace | £4 95 | Plasma |
| Multiplan | Ut | Commodore 64 | £99 95 | Microsoft |
| Multitron | Arc | Vic20 | £7 95 | Sumlock |
| Oligopoly | S | Spectrum | £6 00 | CCS |
| Pengwyn | Arc | Spectrum | £6.95 | Postern |
| Pi-balled | Arc | Spectrum | £6 95 | Automata |
| Puzzle Pack | S | Vic20 | £6.95 | Sumlock |
| Q Man | Arc | BBC | £6 95 | MRM |
| Rolexkunt | Arc | Ace | £4 95 | Plasma |
| Scorpion | Arc | Vic20 | £7.95 | Sumlock |
| Siren City | Arc | Commodore 64 | £7 95 | Interceptor |
| Skramble | Arc | CMB64/Vic20 | £7 95 | Anirog |
| Space Rescue | Arc | Vic20 | £6 95 | Sumlock |
| Star Trader | S | BBC B | £7 95 | FBC Systems |
| Starship Escape | Arc | Vic20 | £9.95 | Sumlock |
| Stockmarket | S | Spectrum | £6 95 | CCS |
| Tankbattle | Arc | Ace | £4 95 | Plasma |
| Tarot | S | Atari | £12 95 | English |
| Timebomb | Arc | Spectrum | £6 95 | CDS |
| Token of Ghall | Ad | Commodore 64 | £7 00 | Interceptor |
| Triad | Arc | Vic20 | £7 95 | Sumlock |
| Vortex Raider | Arc | Commodore 64 | £7 95 | Interceptor |
| Xanagrams | S | Spectrum/BBC B | £6 95 | Postern |

Key Ad — adventure Arc — arcade Ed — education
S — strategy simulation Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week All suppliers should send details of their new programs to This Week, Popular Computing Weekly 12 13 Little Newport Street London WC2R 3LD



# Plug-compatible

Two computers with 16-bit microprocessors both costing around £400 are due on the market in a short while — the Sinclair QL and the Advance 86a

The two machines follow differing design philosophies and the two approaches are very familiar to those whose experience extends to the world of main frame computers They are the plough your own furrow and the plug compatible schools of thought

For many years main frame manufacturers have either decided to make their products compatible with IBM (plug-compatible products such as Amdahl) or decided to make their own way with products so distinctly excellent that they will be purchased in preference to IBM (eg Honeywell or ICL)

With IBM becoming dominant in the upper reaches of the micro business market with its PC and now PCjr the trend with low cost professional machines is set to follow the same path as the main frames Any manufacturer has to think very carefully about IBM before launching a new micro

By choosing Motorola for the 16-bit chip incorporating microdrives on-board designing its own Basic and operating system Sinclair Research seems to have chosen to be a Honeywell rather than an Amdahl

Sinclair Research has been very successful in the past in producing highly novel idiosyncratic products — trail blazers in fact It has been said that if Sinclair did not exist then somebody would have had to invent him What was meant was that Sinclair added a sense of the magical to personal computing though he had a good team his personality was the driving force behind it

In moving into a new sector of the market and one which is already well supplied with machines Sinclair Research is not in the same position of advantage it was with their small computers A product has to be very good to sell to the serious user However at about £400 many non serious users bought the BBC model B and possibly that is the market for the QL, the upmarket personal user

We know very little about the Advance but we do know that it is a plug-compatible computer (ie compatible with the IBM PC) The designers of the Advance took a design decision at the start to be plug-compatible with the IBM PC in a similar way In the world of mainframes Amdahl and Hitachi design computers and peripherals so that IBM software and add-ons work without modification

The way in which Amdahl and Hitachi sell their plug-compatible products is to make them cheaper and faster and anything else to give them an edge over IBM Plug compatible manufacturers are not trying to drive IBM out of business because if IBM folded so probably would the plug-compatible manufacturers IBM look alikes are only viable if IBM is still the dominant computer manufacturer because who wants to be a look alike to a manufacturer whose products do not sell well?

The Advance is IBM PC compatible is faster, and — according to somebody who has used a pre production version — is a nice machine to use The Advance uses the Intel 8086 chip (the IBM PC uses the 8088) and so is an advance (no humour intended) on the IBM in terms of technology

With the QL and the Advance we have two very cheap 16 bit machines with two opposing views of the market and it should be very interesting to see how they fare

Why is the IBM PC so popular (though it costs far more than say the Sirius)? The reason is simple You can trust the IBM they will not fold overnight and when they enhance their machines they always ensure that old software will run on the new machines

How many other personal computer manufacturers can say that? ■

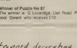
**Boris Allen**

## Puzzle

# Sale bargains

**Puzzle No 92**

Sue Sale went to the sales to buy a new electric toaster and came back with many wondrous things — but not I ought to add the toaster!



It turned out that she had bought 25 items and had spent exactly £25 on the four types of goods listed

| | |
|---|---|
| Bath towels | two for £1 |
| Tablecloths | £1 each |
| Saucepans | two for £5 |
| Sets of cutlery | £5 each |

How many of each had she bought?

**Solution to Puzzle No 87**

If the addition sum is examined it is seen that if we assign values to the letters N and S we can immediately find out the value of A Once this is known the value of T can likewise be determined This enables us to reconstruct the complete sum and check if any of the possible results match up

```
10 FOR N = 0 TO 9 20 FOR S = 0 TO 9 30 IF N = S
THEN GOTO 160 40 LET X$ = STR$ (N + S) 50
LET A = VAL (X$(LEN X$) 60 IF A = S OR A = N
THEN GOTO 160 70 LET X$ = STR$((N * 10 + N) +
(N * 10 + S) + (N * 10 + S)) 80 IF LEN X$<2 THEN
LET X$ = "0" + X$ 90 LET T = VAL (X$(LEN X$ -
1)) 100 IF T = A OR T = N OR T = S THEN GOTO
160 110 LET ANN = A * 100 + N * 10 + N 120 LET
TANS = T * 1000 + A * 100 + N * 10 + S 130 LET
STANS = S * 10000 + TANS 140 LET SANTA = S *
10000 + A * 1000 + N * 100 + T * 10 + A 150 IF ANN
+ TANS + STANS = SANTA THEN PRINT S A N T A
160 NEXT S 170 NEXT N
```

From this the only solution is S = 4 A = 5 N = 7 and T = 2, giving 577 + 2574 + 42574 = 45725

**Winner of Puzzle No 87**

The winner is G Loveridge Usk Road Pontypool Gwent who receives £10



but seriously **AUTOMATA**

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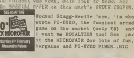
Well folks .. far be it from us to actually ADVERTISE anything on our glorious BACK PAGE, but in order to celebrate the PIMAN's return to the bosom of his happy family, (and to appease the AUTHORS of his new program) .. we want to encourage you to purchase and enjoy.

**PI-Balled** our latest ENTERTAINMENT! It costs six quid and it runs on the 48K Spectrum. The graphics are SUPERB The FREE MUSIC on the flipside is wonderfully offensive, (and the authors want their measly ROYALTIES!)

HI THERE YOU GUYS, THIS IS

**UNCLE GROUCHO**

speaking. Just a reminder that my computer entertainment where DREAMS COME TRUE contains the identity of a world-famous Hollywood Star. The GENIUS who finds it gets to meet the STAR in the USA, travelling CONCORD & QE2, and staying in the Waldorf New York, with £500 to blow. See the SPECIAL OFFER in this week's ORDER COUPON.




Wocha! Stagg-Beetle 'ere, 'im who wrote PI-EYED, the funniest arcade game on the market (only £8) and I want me ROYALTIES too! See yer at the MICROFAIR for lots of fun, bargains and PI-EYED PIMEN ..HIC

